

MacWEEK

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Dayna SafeDeposit
Dayna accumulates interest with backup adjunct

Orange PC
NuBus card puts a PC in your Mac, but the two aren't well-integrated

CD-ROM drives
A comparison of the new double-speed drives

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In Reviews

Special Report

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New Dataproducts technology due for LaserWriters

By Matthew Rothenberg

Woodland Hills, Calif. — New networking technology from Dataproducts Corp. promises to extend the horizons of the company's own printers as well as future LaserWriter models from Apple.

The new software, which Dataproducts has dubbed Virtual Printer Technology (VPT), turns the printer into a network server that can be set up with as many as 64 "virtual printers," accessible by all CPUs on a mixed network.

Initially, VPT will be available this month with two new Dataproducts printers, the LZR 1580 and LZR 2080. With VPT, each virtual printer can be configured with settings for resolution, language emulation, networking protocol and default paper tray. Users can select from among multiple Mac-compatible virtual printers via the Chooser, thus changing the configuration of the printer for a particular print job without inconveniencing other users.

Dataproducts said future models will let users choose resource-

See Dataproducts, Page 116

Speedy new Macs blowing into town

Quadra, Centris go 'av' with new models

By Robert Hess

Cupertino, Calif. — The hurricane season should end with the arrival of some eagerly awaited storms. The Macintosh Quadra 840av, code-named Cyclone, and the Macintosh Centris 660av, code-named Tempest, are expected to be available by September.

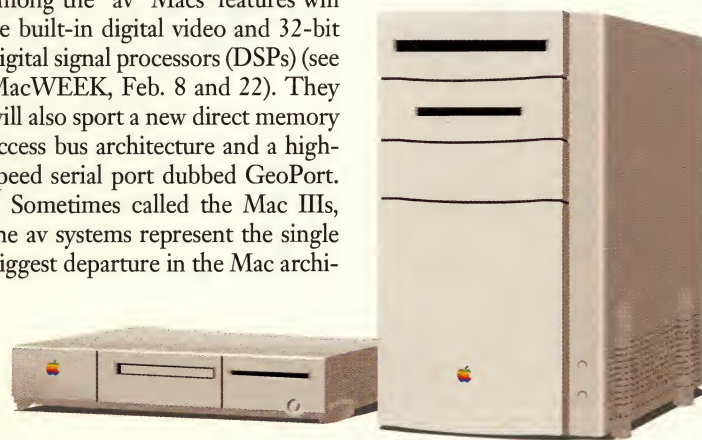
As previously reported, chief among the "av" Macs' features will be built-in digital video and 32-bit digital signal processors (DSPs) (see MacWEEK, Feb. 8 and 22). They will also sport a new direct memory access bus architecture and a high-speed serial port dubbed GeoPort.

Sometimes called the Mac IIIs, the av systems represent the single biggest departure in the Mac archi-

ture since the Mac II. But while these "kitchen sink" Macs come with a lot of new technology, sources said street prices will start at about \$2,300.

► **Quadra 840av.** Coming in the Quadra 800 case, the 840av will run on a 40-MHz 68040; have three NuBus slots, which accommodate long (13-inch) cards; and support three internal SCSI devices. The base configuration will come with 8 Mbytes of memory, expandable to 128 Mbytes via 60-nanosecond,

See New Macs, Page 114



Centris 660av

Quadra 840av

Will open-systems Mac open doors?

By April Streeter

Cupertino, Calif. — Apple's plans to take Macintosh applications and system services into a brave new world of open-systems computing may face stiff competition from a number of fronts.

Apple last month announced that it will move parts of the Macintosh environment to a variety of vendors'

RISC-based hardware running different flavors of the Unix operating system (see MacWEEK, May 17). The plans are part of a far-reaching cross-platform scheme, known as Companion, that will eventually result in a modular Macintosh operating system running on RISC and, reportedly, Intel platforms.

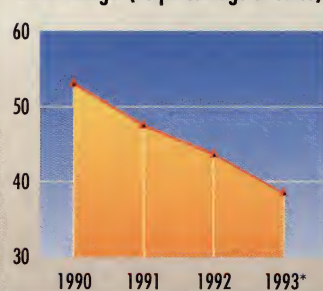
The first open-systems product will consist of an emulator and ported pieces of the Mac OS that let users run off-the-shelf Mac applications inside a Unix X Window machine. Known as Macintosh Application Services, the package

See Open systems, Page 115

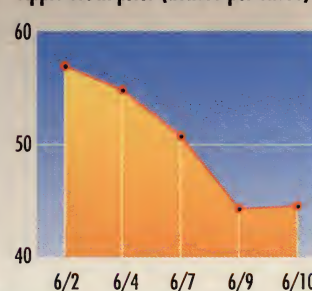
News Analysis

Dwindling margins, declining stock

Gross margin (as percentage of sales)



Apple stock price (dollars per share)



Sources: Apple, Nordby International Inc. *Q2 1993.

Apple to cut prices again

Earnings projection prompts quick action

By Lisa Picarille and Jon Swartz

Cupertino, Calif. — Apple this week will cut the prices of selected Macs and peripherals 7 percent to 26 percent in the wake of its announcement last week that second-half earnings will fall short of expectations.

Apple late Friday would not name the discounted products. The company also reacted quickly last

week with a rebate program for 25 products (see story, Page 3).

The earnings announcement sent Apple stock reeling, plummeting 22 percent, from \$57 to \$44.50, after the company said profits would be "lower than expected" because of price wars in the personal computer and peripherals markets.

In a terse statement, Apple CEO John Sculley said growth in unit shipments is coming at "lower prices than we previously expected — and this will diminish our profitability."

See Apple, Page 114

Real Soon

Adobe Acrobat juggles text, graphics for corporate docs

By Ross Scott Rubin

Seeking a new milestone in the quest for the paperless office, Adobe Systems Inc. this week will release its long-heralded technology aimed at liberating the exchange of electronic documents from the shackles of their specific file formats and fonts.

Dubbed Adobe Acrobat, the product comprises three retail packages — Acrobat Exchange, Acrobat Reader and Acrobat Distiller. Acrobat will work on any Macintosh using System 6.0.5 or later and any IBM PC or compatible running Microsoft Windows 3.1. Unix and DOS versions will follow later this year.

We looked at a prerelease version of Acrobat to get a general feel for how the program worked; an in-depth review that deals with many of the

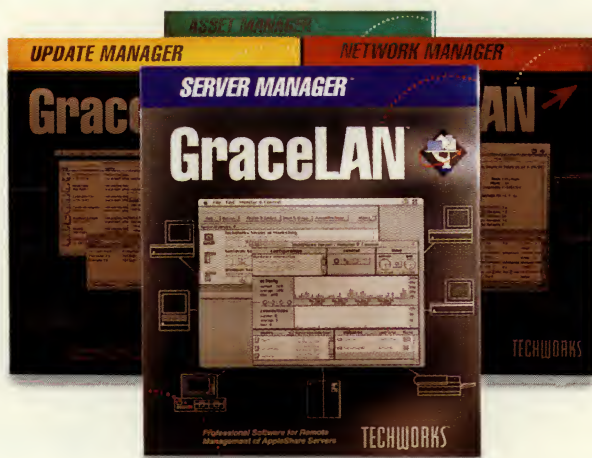
technical and cross-platform issues will be published in a few weeks.

Acrobat leverages previous Adobe innovations such as PostScript and the multiple-master font substitution found in SuperATM. Using a new file format called the Portable Document Format (PDF), Acrobat allows users with different computing platforms, applications and fonts to view, print, annotate and copy portions of complex, formatted documents with styled text and color graphics.

Unlike the bit-map-based Digital Paper format used in No Hands Software Inc.'s recently released Common Ground, Acrobat relies on Adobe Type Manager for type rendering and font substitution, allowing

See Acrobat, Page 116

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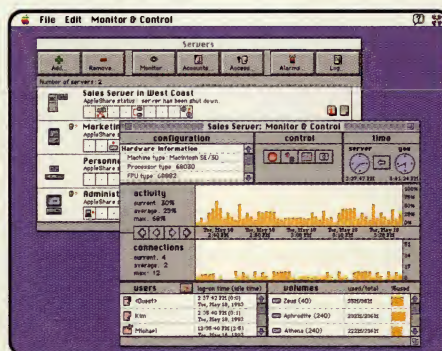
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It's summer school for the newest integrated Mac

By Andrew Gore

Cupertino, Calif. — Starting next month there will be a colorful new Apple on the teacher's desk.

The LC 520, the Color Classic's bigger, faster brother will start shipping in July only to education customers, sources said. As previously reported, the new Mac will sport the same logic board as the LC III: a 25-MHz 68030 chip running on a 32-bit data bus, a socket for an optional math coprocessor, and one LC-style processor direct slot. The new system will include an integrated 14-inch Sony Trinitron monitor supporting 640 by 480 pixels at 69-dpi resolution.

The LC 520 includes 768 Kbytes of video RAM and can show up to 16-bit color on the built-in display; the unit does not support video output. It comes with 5 Mbytes of RAM, expandable to 36 Mbytes through a single SIMM slot.

The Mac's front panel has two stereo speakers, a built-in microphone, a headphone jack, and push-button volume and contrast controls.

All LC 520 configurations will have a double-speed CD-ROM. The



Apple's new LC 520 will ship next month.

LC 520 will be the first LC to support stereo sound-out and will be the first Mac to include stereo speakers.

The LC 520 will come in three flavors: one with 5 Mbytes of RAM, an 80-Mbyte hard drive and a CD-ROM drive; an 8/80/CD; and an 8/160/CD. Education prices are expected to start at less than \$2,000. It will weigh more than 40 pounds and will not include a handle, sources said. □

Apple ships 15-pound LaserWriter

By Matthew Rothenberg

Cupertino, Calif. — Apple this week revealed a petite new model at the low end of its laser printer line.

The Personal LaserWriter 300, to ship this week for \$689, is based on a Canon engine that prints 4 pages per minute at a resolution of 300 dpi and handles letter, legal- or A4-size pages. The printer weighs just 15.4 pounds. It automatically powers down between print jobs to save energy.

The Personal LaserWriter 300 lacks a PostScript interpreter. It will ship with a 100-sheet universal paper cassette and 39 TrueType fonts. It includes only an RS-422 serial interface but ships with Apple's GrayShare software utility, which outputs gray-scale images and allows other users on an AppleTalk network to spool print jobs to the "host" Mac with the Personal LaserWriter 300 attached.

A straight-through paper option is available at the flip of a switch, but no bulk feeder will be offered.

Apple reportedly is hoping to ship a higher-end configuration of the Personal LaserWriter 300 early next year. Instead of PostScript, sources said, this enhanced version may use a new page description language based on Apple's QuickDraw GX, the forthcom-

ing upgrade to the Mac's screen-imaging model.

The new Apple printer is based on the same engine as Hewlett-Packard Co.'s HP LaserJet 4ML, which will include Adobe PostScript Level 2 when it ships this summer at a suggested retail price of \$1,279. □

Apple offers rebates from \$50 to \$350

Cupertino, Calif. — Just two days after disclosing that earnings would be lower than expected, Apple last week announced rebates of \$25 to \$350 on 25 CPUs and peripherals.

The rebates, which range from \$50 on the Mac Classic II and Color Classic to \$350 on the Duo Dock with a 230-Mbyte hard drive, are effective immediately. The program runs through Sept. 30.

Among other rebates: PowerBook 180 4/80 and 4/120, \$100; PowerBook Duo 210, \$100; Mac IIvx 5/80 with CD-ROM drive, \$300; Centris 610 8/230 with CD-ROM, \$300; and Personal LaserWriter NTR, \$200.

The LC III, Centris 650 and Quadra line are not included in the rebate program. □

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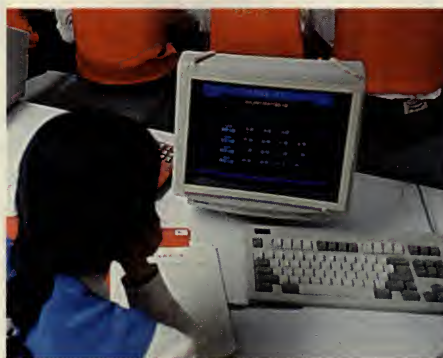
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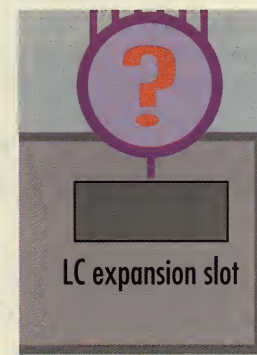
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QMS color laser heading to market

By Matthew Rothenberg

Mobile, Ala. — QMS Inc. this week will take the wraps off the ColorScript Laser 1000, the first PostScript-compatible color laser printer priced at less than \$12,500.

The ColorScript Laser 1000, to ship in volume in the fall for \$12,499,



QMS' \$12,499 ColorScript Laser 1000 is a Level 2-compatible laser printer that can output 2 CMYK pages per minute.

is based on a 300-dpi engine that transfers toner from four CMYK (cyan, magenta, yellow, black) hoppers onto a single imaging drum for one-pass output onto letter- or legal-size paper. QMS declined to identify the manufacturer of the engine.

The printer outputs either monochrome or color images or text to plain paper or transparencies. It prints 8 monochrome pages per minute and outputs four-color pages at a rate of 2 ppm.

The ColorScript Laser 1000 will come with QMS' own PostScript Level 2 emulation and 65 resident fonts, and it switches automatically to PCL 5 and HP-GL/2 interpreters. It also includes two card slots for additional fonts and emulations.

The printer uses the company's multitasking Crown architecture for handling multiple print jobs across mixed networks. It will come with Eficolor rendering dictionaries from Electronics for Imaging Inc. of San Bruno, Calif.

The ColorScript Laser 1000 includes simultaneously active LocalTalk, RS-232C serial and parallel

interfaces. An Ethernet interface and TCP/IP software will be optional.

The printer runs on a 25-MHz Intel 80960CF RISC chip with 12 Mbytes of RAM, which can be expanded to 32 Mbytes, and it includes a 60-Mbyte hard drive that stores printer commands.

EFI and other companies offer controllers that allow color photocopiers to act as PostScript output devices, but the ColorScript Laser 1000 will be among the first color laser printers to come standard with a PostScript interpreter. In addition, the printer will cost half as much as the \$25,000 PostScript-compatible model of the CP4007 color laser from Colorcops Corp. of Norcross, Ga. (see MacWEEK, April 26).

Sources said Hewlett-Packard Co. also is working on a color laser printer, which reportedly uses a Konica engine, that may be available by the end of the year (see MacWEEK, April 12).

QMS Inc. is at 1 Magnum Pass, P.O. Box 81250, Mobile, Ala. 36689-1250. Phone (205) 633-4300; fax (205) 633-0013. □

Radius deals speedy 24-bit, DSP graphics cards

By Neil McManus

San Jose, Calif. — Radius Inc. will stir up the color graphics market this week with a new, accelerated 24-bit display board and a PDS-based DSP card for image processing.

► **PrecisionColor Pro.** Available this month for \$2,499, this 7-inch card works with all NuBus Macs, including the Centris 610 (with optional NuBus slot adapter). It uses a custom application-specific integrated circuit to accelerate all QuickDraw calls.

The board delivers 24-bit graphics on displays as large as 21 inches and supports on-the-fly switching among several resolutions, including 1,152 by 870 pixels, 832 by 624 pixels and 640 by 480 pixels.

Radius said its card is the fastest 24-bit graphics board on the Mac market, but the company added that it expects conflicting claims from SuperMac Technology Inc. "There will be a flurry of benchmark claims between [Radius] and SuperMac, but we've both got the boards going about as fast as anyone would want them to be," said Chuck Berger, Radius president and CEO.

► **PhotoBooster.** Due in mid-July for less than \$1,000, this card fits the processor direct slot of the Mac Centris 650 and the Quadra models. It uses twin AT&T Co. 3210 digital signal processors (DSPs) running at

66 MHz to accelerate specific graphics tasks by as much as 10 times faster than the Quadra 950.

Unlike many Mac DSP boards, which use the AT&T DSP 16A chips, the DSP chips on the Radius card will reportedly be compatible with software designed for Apple's upcoming Cyclone (see story, Page 1).

The PhotoBooster will come with 13 Radius-developed Adobe Photoshop filters, such as Blur,

Despeckle, Sharpen, Find Edges and High Pass. The board will speed conversion of RGB (red, green, blue) to CMYK (cyan, magenta, yellow, black) by as much as 100 percent over the Quadra 950.

Radius is developing a version of the board for use with its 68040-based Rocket accelerator cards.

Radius Inc. is at 1710 Fortune Drive, San Jose, Calif. 95131. Phone (408) 434-1010; fax (408) 434-0770. □

Procom releases ATOM squad

By Robert Hess

Irvine, Calif. — Procom Technology Inc. last week introduced four 340-Mbyte hard drive configurations based on a Toshiba Fast SCSI-2 mechanism with a 128-Kbyte cache and a 12-millisecond access time.

► **ATOM 340-PB.** An internal PowerBook drive priced at \$1,295, the 340-PB replaces the PowerBook's internal hard drive. Because PowerBooks do not include SCSI-2 controllers, they cannot take full advantage of the drive's performance.

► **ATOM 340-PB/X.** This \$1,395 package includes the ATOM 340-PB plus a shock-resistant enclosure and external power adapter that can transform the PowerBook's original internal

hard drive into an external unit.

► **ATOM 340-LW.** Intended for Apple's LaserWriter Pro 630 printer, this \$1,295 package includes all cables needed to attach an externally configured ATOM 340 to the printer.

► **ATOM MD 340.** Nearly identical to the ATOM 340-PB/X, this package comes with standard SCSI cabling for desktop Macs. It sells for \$1,395.

Procom also announced price reductions on its existing ATOM-series drives. Available in 80- to 200-Mbyte configurations, the drives now range in price from \$595 to \$995.

Procom Technology Inc. is at 2181 Dupont Drive, Irvine, Calif. 92715. Phone (714) 852-1000; fax (714) 852-1221. □

Inspector								
Business								
File Name	Original	Compressed	Saved	Status	Creator	Type	Label	
1992 Year-end Report	10.0K	5.8K	42%	Compressed: Faster	MSWD	WDBN	None	
1993 Objectives	15.8K	.....	.....	Uncompressed	MSWD	WDBN	None	
Expense Reports/Jan 93	62.5K	19.5K	69%	Compressed: Faster	BOBO	CWSS	None	
Expense Reports/Feb 93	19.5K	.....	.....	Uncompressed	BOBO	CWSS	None	
Masthead.eps	43.5K	9.4K	78%	Compressed: Faster	FHA3	EPSF	None	
Newsletter/Jan 93	100.2K	25.4K	75%	Compressed: Smaller	ALD4	ALB4	None	
Newsletter	25.4K	.....	.....	Uncompressed	ALD4	ALB4	None	
Product Descriptions.sea	254.7K	.....	.....	Archived	NCse	APPL	None	
Q1 '93 Objectives	6.5K	.....	.....	Don't Compress: Item	MSWD	WDBN	None	
Q4 '92 Actuals Summary	6.5K	.....	.....	Uncompressed	MSWD	WDBN	None	
Team Photo.TIFF	235.3K	36.4K	84%	Compressed: Faster	TIFF	TIFF	None	
Compressed: 5 of 11 770.2K 415.3K 46%								

To help users track and organize compressed archives, Now Compress' Inspector window offers a Finder-like view into the status, size and history of compressed files.

Now ships two new apps, updates calendar program

By Robert Hess

Portland, Ore. — Now Software Inc. last week shipped two new products and an update to another program.

► **Now Compress.** A new entry in the crowded file-compression market, Now Compress incorporates and offers compatibility with other compression standards.

The program can perform idle-time compression (compressing files without user involvement when the Mac is not busy) like Fifth Generation Systems Inc.'s AutoDoubler and Aladdin Systems Inc.'s SpaceSaver; on-demand compression (compressing files at the user's request) like Fifth Generation's DiskDoubler and Aladdin's Magic Menu; and archival compression (combining several files into one) like Aladdin's StuffIt, DiskDoubler and Bill Goodman's Compact Pro.

One feature unique to Now Compress is its Inspector window, which lists a disk's contents, including files' compression states and sizes. Archives that have been created by Now Compress, StuffIt 1.5, DiskDoubler or Compact Pro may be opened like a folder in the Finder, and individual files may be extracted without affecting the other files in the archive.

Upon installation, Now Compress can convert a user's files from AutoDoubler/DiskDoubler, Compact, SpaceSaver and StuffIt 1.5 to Now Compress format. The program sells for \$99 for a single-user package; a 50-user pack is \$3,799.

► **Now Fun!** A \$69 collection of five utilities, Now Fun includes FunScreenSavers, an After Dark-compatible screen saver that can also open QuickTime movies, Macromedia Projector (accelerated) movies and PICS animations. Other utilities include FunColors, which colorizes windows and dialog boxes; FunPictures, which places any pattern or picture, including PICT, GIF (Graphic Interchange Format),

TIFF, Paint, Wallpaper and QuickTime images, on the desktop; FunCursors, which replaces standard system cursors with animated versions; and FunSounds, with which users can attach sounds to 54 system events.

Until July 30, owners of other Now products may purchase Now Fun! for \$19.

► **Now Up-to-Date 2.0.1.** Not just a bug fix, the new version adds a split window in multiday and day views. In the bottom of the window, Up-to-Date lists non-time-specific items, such as to-do's.

Up-to-Date's Reminder extension has been improved, making it easier to postpone reminders under keyboard control.

Registered owners will receive the upgrade automatically or can download it from major on-line services.

Now Software Inc. is at 319 W. Washington St., Portland, Ore. 97204. Phone (503) 274-2810; fax (503) 274-0670. □

For the record

The LaserMaster Unity 1200XL printer mentioned in the May 17 issue has been discontinued. LaserMaster Corp. offers the LaserMaster 1200XL, which lacks a hard disk and is priced at \$4,995.

The story about MicroMat Technology Inc.'s SIMMdoubler II in the May 31 issue was incomplete and in some ways incorrect about the use of memory-expansion hardware in the original Mac II. A 68851 PMMU (paged memory management unit) must be installed in the Mac II to take advantage of memory beyond the machine's original 8-Mbyte maximum. With the PMMU installed, SIMMdoubler II increases the Mac II's maximum RAM capacity to 64 Mbytes and allows users to install standard 4-Mbyte SIMMs.

Looks like Mac users just got their very own HP LaserJet.



The new generation HP LaserJet 4M printer.

At last. An HP laser printer built specifically for the Mac—the new LaserJet 4M. A laser printer with everything Mac users need. From built-in PostScript™ Level 2 software from Adobe™ to standard LocalTalk and optional EtherTalk.

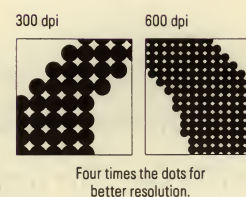
The finest print quality in its class.

Thanks to HP's microfine toner, Resolution Enhancement technology, and advanced engine designed expressly for 600 x 600 dpi, the LaserJet 4M printer delivers the finest print quality of any 600-dpi machine available.

And with a new RISC processor and 6 MB of standard memory accelerating formatting and I/O speeds, complex PostScript and graphics files are rendered faster and more clearly than ever before.

Greater flexibility. The HP LaserJet 4M printer also sets new standards in versatility, with a wide range of typefaces and two integrated paper trays.

As well as the options of a 500-sheet tray and power envelope feeder.



Four times the dots for better resolution.

And it's designed to be shared simultaneously by PCs and Macs. Automatic language switching between PCL 5 and PostScript, and 3 hot I/Os give mixed environments greater flexibility. Without compromise to either.

Of course, with the HP LaserJet 4M printer, you'll enjoy HP's renowned quality and reliability. All for only \$2,399.* So call 1-800-LASERJET (1-800-527-3753) Ext. 7340** for print sample† and comparison disk. Or visit your nearest authorized HP dealer.



The HP LaserJet 4M is the one for all. Macintosh and PCs alike. This new generation provides superior output with 600 dpi, Resolution Enhancement technology and microfine toner. 6MB built-in memory means that PostScript files and full-page graphics print out crisp, clear and fast.

True 600 dpi creates rich, full-dimensional text and graphics.

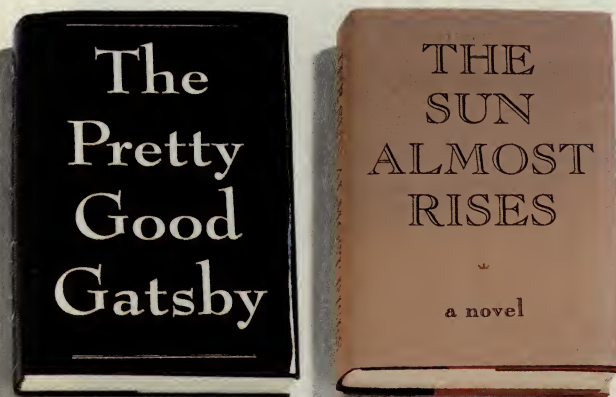
Smoother curves, no jagged edges, thanks to HP's exclusive Resolution Enhancement technology.

Microfine toner makes 600-dpi output look even sharper.

35 PostScript Type 1 typefaces for Mac and PC PostScript language users, 35 Intellifont and 10 TrueType typefaces for PC users produce a broad range of document styles.

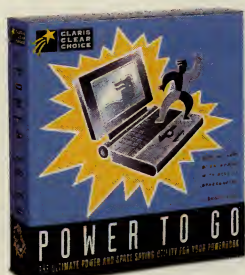


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from Claris Clear Choice.™

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check function. And at \$69, it's never been easier for your PowerBook to live up to its name.



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Mobius Speedster '040 accelerators boost IIci, IIsi, LC II, Performa 400

By Neil McManus

Emeryville, Calif. — Mobius Technologies Inc. this week will release the first models in its Speedster line of 68040 accelerators.

Offering speeds of 25 or 33 MHz, the Mobius Speedsters are available in several configurations for the Mac IIci, IIsi, LC II and Performa 400. Speedsters running at 40 MHz are due this summer.

Speedster versions using the Motorola 68LC040, which lack an FPU (floating-point unit), are \$799 at 25 MHz and \$999 at 33 MHz. Versions using the 68040, with an FPU, sell for \$1,099 at 25 MHz and \$1,299 at 33 MHz.

Mobius plans to release by August Speedster models for the Mac II, IIfx, IIfx, LC III, IIfx, SE/30 and Performa 600. The Speedster plugs into the processor direct slot of the LC

models, Mac IIci and Performa 600. All other Macs require a \$49 adapter.

The Speedsters come with their own '040 PDS slot. Mobius next month will offer a 128-Kbyte static-RAM cache daughterboard as a \$199 option.

Included with the cards is a control panel that lets users choose between 68030 and '040 cache modes. Users can save cache settings on a per-application basis so the Speedster will reconfigure automatically when programs are launched.

The Speedster cards come with software, installation kit, manual and a three-year warranty.

Mobius Technologies Inc. is at 5835 Doyle St., Emeryville, Calif. 94608. Phone (510) 654-0556; (510) 654-2834. □

Applied cards speed Classic by up to 11 times

By Neil McManus

Dallas — Mac Classic users can speed up their machines by as much as 11.5 times with a new series of 68030 accelerator cards from Applied Engineering.

The TransWarp 2300 series of cards, which plug onto the Classic's 68000 processor, also offer optional video expansion and Ethernet support on a single board.

The 25-MHz TransWarp 2325, which retails for \$199, speeds the Classic 4.5 times. With an optional FPU (floating-point unit), the 25-MHz model sells for \$338.

The 40-MHz TransWarp 2340, priced at \$349, provides a speed increase of six times. With an FPU, it sells for \$498; with a 128-Kbyte cache, it is \$428; and with the FPU and the cache, the card costs \$577.

In addition, the 40-MHz model accepts 1-, 2- and 4-Mbyte SIMMs in its four SIMM slots, allowing users to increase the Classic's RAM capacity to 16 Mbytes.

The TransWarp accelerators come with a MagicBus connector, which supports Radius cards for full- and two-page displays. In July, Applied Engineering will offer an optional video daughtercard that supports full-page

monochrome monitors at a 640-by-870-pixel resolution and two-page monochrome displays at a 1,024-by-768-pixel resolution.

Applied next month will also release an Ethernet adapter daughtercard, and a daughtercard that offers Ethernet and expanded video. Prices for the expansion options have not been set.

The company sells a similar series of expandable accelerator cards for the Mac SE (see MacWEEK, May 24). The TransWarp cards come with a 30-day money-back guarantee and three-year warranty.

Applied Engineering, a division of AE Research Corp., is at 3210 Beltline, Dallas, Texas 75234. Phone (214) 241-6060 or (800) 554-6227; fax (214) 484-1365. □

Power To Go saves space

By Raines Cohen

Santa Clara, Calif. — Claris Corp.'s Clear Choice Division this week will add compression to its package of PowerBook utilities.

Power To Go, formerly sold as ALSoft Inc.'s Utilities for the PowerBook, now includes StuffIt SpaceSaver from Aladdin Systems Inc. of Watsonville, Calif.

SpaceSaver, a control panel sold by Aladdin for \$59.95, lets users automatically or manually compress files by an average of 50 percent, Claris said. It can compress or decompress files by keyword, label or placement in specially named folders. The Idle Time Compression feature automatically compresses files unmodified for a user-set period of time. The program includes Magic Menu, an extension that adds a menu of compression options to the Finder.

Version 2.0 remains priced at \$99. Like Version 1.0, it includes power management, customizable security and other functions.

Current users can upgrade for a \$7 shipping-and-handling charge.

Claris Corp.'s Clear Choice Division is at 5201 Patrick Henry Drive, P.O. Box 58168, Santa Clara, Calif. 95052-8168. Phone (408) 987-8227 or (800) 325-2747. □

adambyte extends warranty

Mountain View, Calif. — adambyte this month began offering an extended, five-year-warranty option on its line of powerbox tape and floptical hard drives for PowerBooks.

The company also increased its standard warranty from one year to two. Customers choosing an additional five-year option pay \$49. All warranty options are retroactive.

Shipping for six months, powerbox hard drives come with an interchangeable PowerBook battery with backup software. Models include the \$1,599 200-tape, the \$1,449 200-floptical, the \$2,449 500-tape and the \$2,399 500-floptical.

adambyte is at 2672 Bayshore Parkway, Suite 1045, Mountain View, Calif. 94043. Phone (415) 988-1415; fax (415) 988-1418. □

DeskTape enhances retrieval options

Desktop tape mounter offers free read-only access

By Robert Hess

Irvine, Calif. — Optima Technology Corp. this month upgraded its DeskTape software, adding a utility that can be freely distributed to provide read-only access to DeskTape-formatted media.

DeskTape 1.6 mounts digital audio tape cartridges and 8-millimeter tapes inserted into appropriate drives. Without DeskTape or a similar product that mounts tapes on the desktop, data stored on tape media can be accessed only through backup or archival programs such as Dantz Development Corp.'s Retrospect.

Version 1.6 includes a new utility that can read (but not write to or format) DeskTape-formatted tapes. Users are free to distribute the utility to others who wish to retrieve data from DeskTape media. For example, a user could store a large color separation on DAT and give a tape and the new utility to a print shop that does not own DeskTape.

Using a SCSI-2 tape drive, DeskTape can mount volumes up to 2 Gbytes in size. According to Optima, throughput can be as high as 500 Kbytes per second, depending on the drive used. DeskTape can be configured

to prevent applications from being launched from the tape.

DeskTape 1.6 is compatible with System 6.0.5 and higher; it can take advantage of WorldScript for use in 37 languages.

Optima Technology Corp. is at 17526 Von Karman, Irvine, Calif. 92714. Phone (714) 476-0515; fax (714) 476-0613. □

nView to raise LCD prices

Newport News, Va. — nView Corp. next month will raise the prices on three of its LCD projection systems because of a shortage of key components and the increase in the value of the Japanese yen.

► **Luminator.** This active-matrix multi-source LCD projector will increase in price to \$12,595, up from \$10,995. It supports 250,000 colors and includes a built-in metal-halide light source.

► **MediaPro.** Another multisource active-matrix LCD panel offering 250,000 colors, MediaPro will be \$8,595, up from \$7,995.

► **ViewFrame Spectra C.** Rising in price to \$5,595 from \$4,995, this active-matrix LCD panel displays computer images in up to 185,193 colors.

nView Corp. is at 860 Omni Blvd., Newport News, Va. 23606. Phone (804) 873-1354; fax (804) 873-2153. □

Used-Mac market becoming more user-friendly

By Lisa Picarille

Atlanta — For years one of the biggest arguments against buying Macs was the high price relative to IBM PC clones. But with the proliferation of new models, users can now not only choose from Macs in a variety of price ranges but actually find deals — particularly on used Macs.

Users looking to buy previously owned Macs or trade in outmoded models can now choose from among a variety of brokers that specialize in buying and selling Macs, such as United Computer Exchange Corp. The 1-year-old company acts as a middleman for individuals and

corporations looking to buy or sell used Macs.

The service, which is free to buyers, matches buyers with sellers listing specific equipment. The sellers then pay a commission — from 5 percent to 10 percent of the sales price — to the broker after the sale is completed.

Apple also offers its own trade-in program called Apple Exchange, which lets U.S. businesses (but not individuals) trade in equipment when buying or leasing new Macs.

United Computer Exchange Corp. is at 6065 Roswell Road, Suite 532, Atlanta, Ga. 30328. Phone (404) 250-0476 or (800) 755-3033; fax (404) 250-1916. □

Used Macintosh prices

MODEL	HARD DRIVE	PRICE	MODEL	HARD DRIVE	PRICE
Plus	20 Mbytes	\$375	Ilci	80 Mbytes	\$2,350
SE	20 Mbytes	\$575	Ilfx	80 Mbytes	\$2,850
SE/30	80 Mbytes	\$1,150	Quadra 700	230 Mbytes	\$3,375
Classic	40 Mbytes	\$600	Quadra 900	230 Mbytes	\$3,850
Classic II	40 Mbytes	\$650	Portable	40 Mbytes	\$700
LC	40 Mbytes	\$800	PowerBook 100	20 Mbytes	\$875
LC II	40 Mbytes	\$875	PowerBook 140	40 Mbytes	\$1,425
II	40 Mbytes	\$1,350	PowerBook 145	40 Mbytes	\$1,650
Ilisi	40 Mbytes	\$1,375	PowerBook 160	40 Mbytes	\$1,825
Ilx	40 Mbytes	\$1,625	PowerBook 170	80 Mbytes	\$2,275
Ilcx	40 Mbytes	\$1,550	PowerBook 180	80 Mbytes	\$3,350

Source: United Computer Exchange Corp.

Our New Policy Guarantees Overnight Success.

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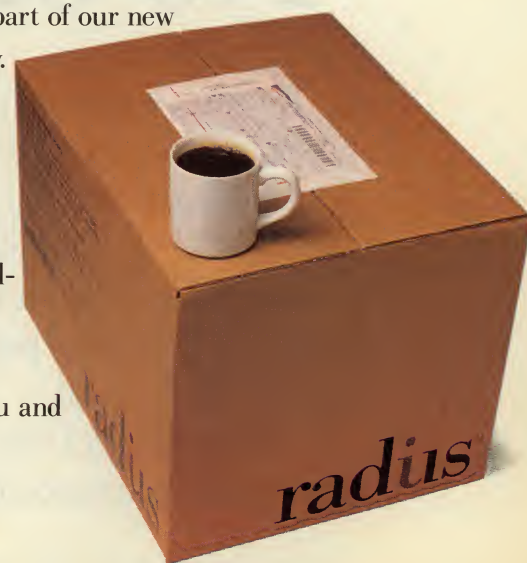
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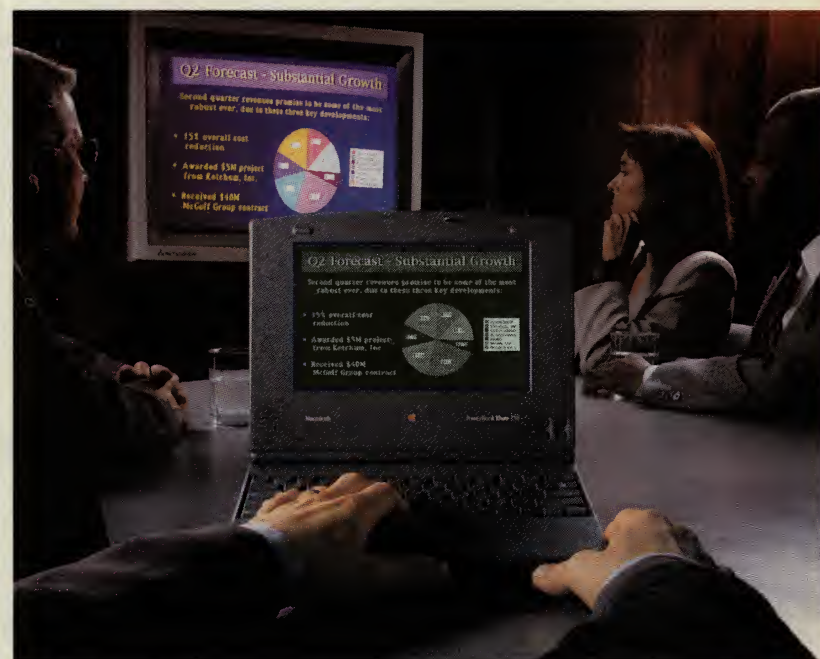
8:00 Home Over breakfast, you check your calendar on your PowerBook Duo. The day looks like it'll be a breeze. You'll put a few finishing touches on the Q2 forecast presentation that's due in a couple of days, return a few calls, and have a free afternoon (for a change).



9:15 Your Office You slide your PowerBook Duo into the Duo Dock and start working. Suddenly, your e-mail chimes. Your boss wants you on the noon shuttle to Boston, to present the Q2 forecast to his boss. Also, a client wants to see you ASAP. You hit the eject button and go.



2:50 Borrowed Office A colleague is at lunch, so you borrow his Duo Dock. You log onto e-mail back at the home office and learn your group has just won a new piece of business. You incorporate this news into your presentation (and change a few colors while you're at it).



3:30 Conference Room You clip on the Duo MiniDock and run the presentation from your PowerBook Duo. Everybody's impressed — especially the guy who asks you a series of tough questions about a six-month-old project. You've got all your files, so you've got all the answers.

No other computer could get

For years, you've been trying to keep up with computers. Now there's a computer that can actually keep up with you: the Apple® PowerBook Duo™ System.

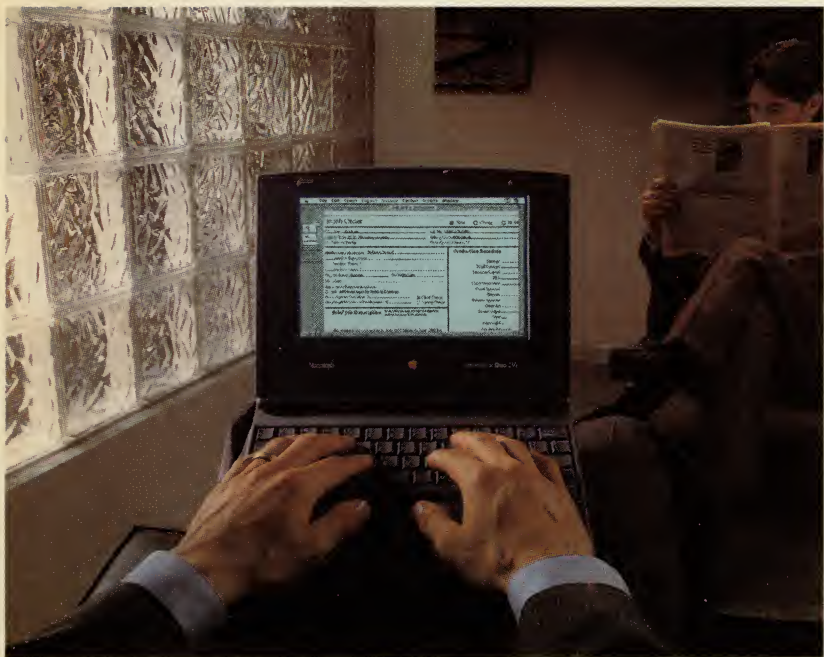
It's nothing less than the most flexible, adaptable and personal computer in the world.

On the road, it's a slim, sleek and powerful notebook computer.

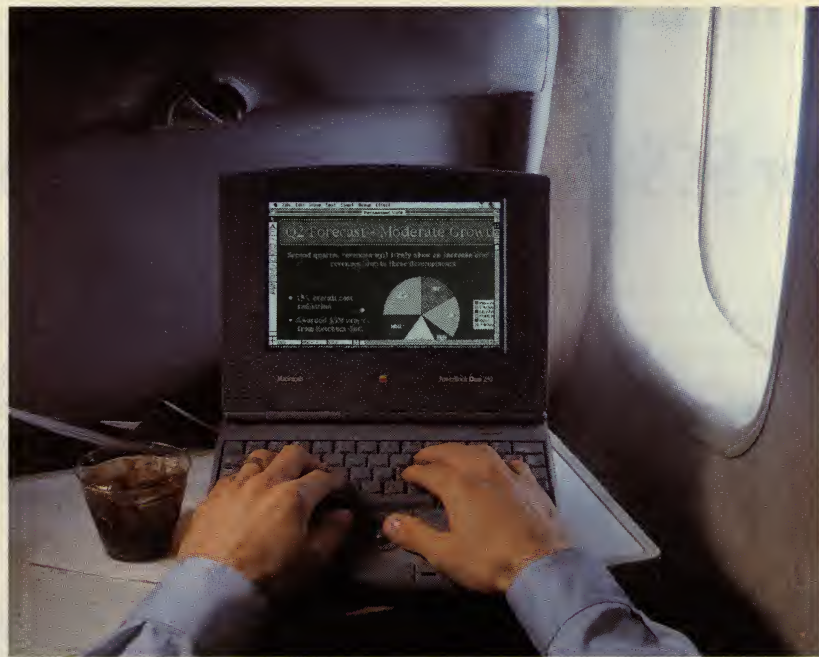
In the office, when plugged into a Duo Dock, it instantly becomes a fully expandable, no-compromise desktop computer that lets you work with a full-size keyboard and up to a 16-inch color monitor.

But what really sets the PowerBook Duo System apart from conventional docking systems is a bit of engineering genius called PowerLatch™ technology. A combination of elegant hardware and intelligent software that

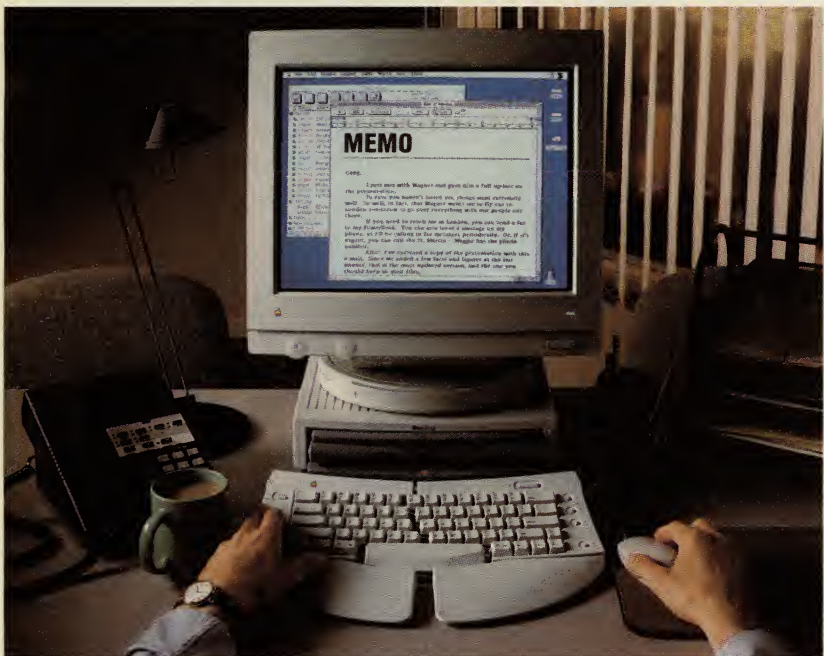
Model	PowerBook Duo 210	PowerBook Duo 230
Weight	4.2 pounds	4.2 pounds
Memory	4MB exp. to 24MB	4MB exp. to 24MB
Storage	80MB	80MB or 120MB
Display	9-inch backlit	9-inch backlit
Battery	Up to 4.5 hours	Up to 4.5 hours
Speed	25 MHz 68030	33 MHz 68030



11:10 Your Client's Office *That \$5 million project the client told you was off last week? It's on again. And due in two weeks. You type up a few job orders, which you'll fax from your PowerBook when you get to Boston. Now, however, you have to catch a cab for the airport.*



12:40 Noon Shuttle *All the files and software you use at your desktop are right here with you. You pull up the Q2 presentation and make the revisions to reflect the new assignment. Then you write a quick memo to your team, to make sure that everything's on schedule.*



7:00 Your Office *On the way home, you swing by the office to tie up a few loose ends. You see your boss. He heard the meeting went extremely well, and wants you to fly out and present to the people in London. Tomorrow. You send out a quick memo to update your staff.*



8:30 Living Room *Since you've got all your files and software right there with you, you could write a report, study the new research data or finish up those performance reviews. But hey, enough is enough. You settle back in your recliner and play a few rounds of Tetris.*

you through a day like this.


lets you move in and out of the office with tremendous ease.

There are no cables to fiddle with and no complicated "reconfiguring" procedures. Just slip the PowerBook Duo into the Duo Dock, and the system automatically recognizes all your networking resources and attached peripherals.

Simply push a button, and a motor gently releases the PowerBook Duo. (It will remind you to save any unsaved files, in case you forget.) Now, wherever you go, your files go with you. You can even add an optional PowerBook Express Modem, to

let you send and receive documents while you're on the road.

To experience the PowerBook Duo System for yourself, call 800-732-3131, extension 100, for the name of the authorized Apple reseller located nearest you. (If you're in Canada, call 800-665-2775, extension 910.) And no matter how dramatically things may change in your life, at least you'll always have the one power you can depend on. The power to be your best.®

PowerBook Duo from Apple 

Hurdler SCSI box adds four serial ports to Mac

By Robert Hess

Rockville, Md. — Creative Solutions Inc. this month shipped the Hurdler SCSI External Quad Serial, an external box that adds four serial ports to a Mac.

Unlike CSI's other serial-port expansion products, which connect via NuBus cards, the

External Quad attaches to the Mac SCSI port. The External Quad's four serial ports are all accessible through the use of the Macintosh Communications Toolbox and proprietary system extensions from CSI.

Each mini-DIN, eight-pin port supports communications at up to 25 Kbps. The

External Quad itself handles handshaking and error correction with each port rather than interrupting the Mac.

To improve serial performance, the External Quad comes with 64 Kbytes of internal RAM buffer. All External Quads are controlled by two processors, one for

SCSI and one for serial data transfer.

The device comes with a power supply and SCSI cable. It has two SCSI ports, so it can be daisy-chained.

The SCSI External Quad Serial sells for \$695. Until September it will be priced at \$595.

Creative Solutions Inc. is at 4701 Randolph Road, Suite 12, Rockville, Md. 20852. Phone (301) 984-0262 or (800) 367-8465; fax (301) 770-1675. □



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Accountant, Inc. gets new life as MacP&L

By Ian G. Jacobs

Irvine, Calif. — State of the Art Inc. this week will ship an entry-level accounting package called MacP&L.

Formerly sold by Coral Gables, Fla.-based Softsync Inc. as Accountant, Inc., the new release will sport a few new features and a much lower price.

MacP&L, aimed at entry-level small-business users, now allows increased flexibility in the tracking of checks. Handwritten checks can now be entered into general ledgers. Account codes and names have also been made more flexible.

A single-user version of MacP&L will sell for \$269, down from Accountant, Inc.'s price of \$595. The multi-user version was dropped from \$1,195 to \$599. While Accountant, Inc.'s multi-user license was for three users, MacP&L's multi-user version allows unlimited users.

Owners of either the single or multi-user versions of Accountant, Inc. can upgrade to MacP&L for \$29.

State of the Art Inc. is at 56 Technology, Irvine, Calif. 92718. Phone (714) 753-1222; fax (714) 753-1569. □

Gradebook crosses platforms

By April Streeter

Colorado Springs, Colo. — First Class Systems Inc. this month will ship software that lets a teacher share a grading database between Macintosh and Windows-based computers.

First Class Gradebook, priced at \$129 for either a Mac or Windows version, consists of a relational database with a simple graphical interface. Teachers enter student and class data on a preformatted grid that looks like a standard grade book and define grading scales, either letter, number or some combination of both, according to their own criteria.

The program handles translation between the Mac and Windows environment for teachers who work on both systems.

First Class Gradebook can handle an unlimited number of student, class and assignment entries. The program is password protected.

The program's report generator lets teachers print out the entire grade book, summary reports or individual student reports.

First Class said it is working on a network version of the program, which will allow more than one teacher to simultaneously access student and class data on a server.

First Class Systems Inc. is at P.O. Box 50005, Colorado Springs, Colo. 80949. Phone (719) 599-4664 or (800) 632-4723; fax (719) 599-4612. □

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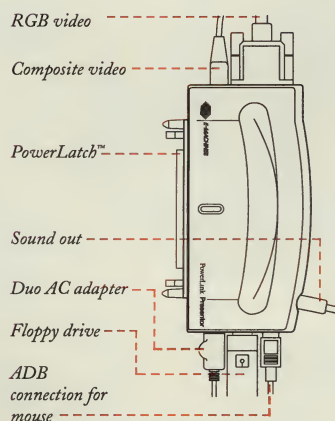


PowerLink Presenter easily connects to the back of your PowerBook Duo.

Until now, giving presentations on the road meant carrying heavy, cumbersome equipment to the presentation site. The portability of the PowerBook Duo and PowerLink Presenter means that travel and setup are easy and efficient.



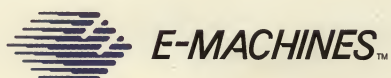
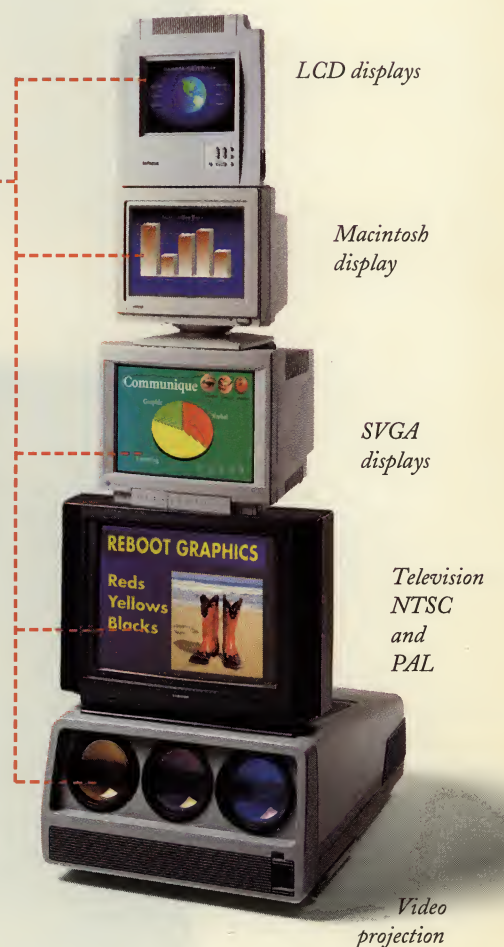
PowerLink Presenter comes in its own handy little carrying case.



You can use whatever display devices are available, because PowerLink Presenter connects the PowerBook Duo to Macintosh® and SVGA displays, LCD panels, video projectors and NTSC or PAL televisions.

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For information via fax, call 800-541-4787.



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applications." And according to MicroTimes, GlobalFax is "a delight. Pressing the Option key converts from print to fax output. The fax directory, transmission and printing tools are comprehensive and easy to use."

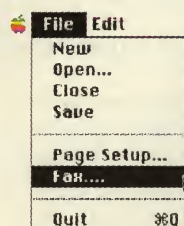
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Updated TopDown targets quality

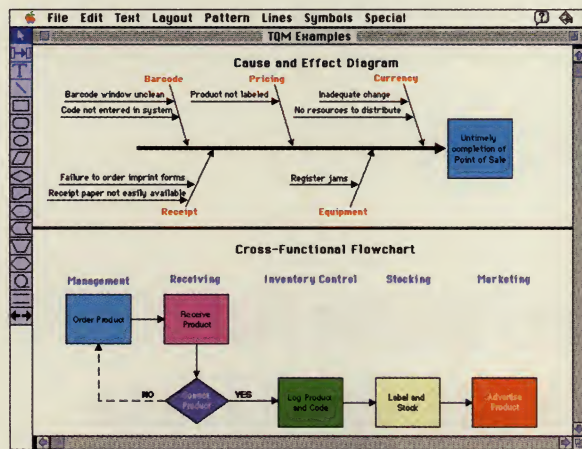
TQM Toolkit helps companies organize

By Ian G. Jacobs

Houston — Kaetron Software Corp. has reworked its flowcharting software to make it easier for companies to institute the organizational concept of total quality management.

Kaetron has updated its TopDown Flowcharter 3.5 (see MacWEEK, Jan. 18) and paired it with a new guide that offers methods to integrate the total quality management (TQM) technique with the software. The resulting package, which began shipping last month, is called TQM Toolkit.

The \$325 package, available only from Kaetron, includes new connectors, worksheets and flowchart templates. New symbols, such as clouds for brainstorming, have also been added.



Kaetron's TQM Toolkit combines an 85-page guide with its TopDown Flowcharter program, updated with new symbols and connectors, to diagram total quality management.

In addition, an 85-page guide explains the theory of total quality management and offers methods of instituting and charting changes.

The company has said it will offer periodic upgrades to the product and the guide to reflect changes in management theory. The first such upgrade will be available by the end of the summer.

A Windows version of TQM Toolkit is due by the end of the year.

Users of TopDown Flowcharter 3.5, which still lists for \$345, can upgrade to TQM Toolkit for \$149.

Kaetron Software Corp. is at 25211 Grogans Mill Road, Suite 260, Houston, Texas 77380-2924. Phone (713) 298-1500 or (800) 938-8900; fax (713) 298-2520. □

Forms makers move to bridge Mac, PC platforms

Shana, Delrina data to be interchangeable

By Lisa Picarille

Toronto — Delrina Corp. and Shana Corp., leaders in the IBM PC-compatible and Macintosh electronic forms-generation software market, respectively, are working together to simplify the process of filling out forms across platforms.

Earlier this month the two companies announced an agreement whereby each will develop its own set of filters and translators. These products, slated to ship in July, will enable both Mac and PC users to enter data into forms designed by the other company's forms software. The companies have not determined product names and pricing.

Although Delrina, based here, and Shana each plans to sell their own translation products, the two companies are still discussing possible bundling and co-marketing arrangements.

With the forthcoming translators, users of Shana's Mac-based Informed Foundation forms program will be able to fill in forms created with Delrina's Windows-based PerForm PRO and FormFlow products. In turn, users of those Delrina products will be able to fill in forms generated by Shana's Informed program.

Shana also offers translation filters for defunct forms products such as Claris Corp.'s SmartForm and Adobe Systems Inc.'s TrueForm.

Delrina officials said the deal with Shana was prompted by a lukewarm response to last year's introduction of PerForm PRO Filler for the Mac, which let Mac users fill in forms created by PerForm PRO for Windows.

Delrina Corp.'s U.S. office is at 6830 Via Del Oro, Suite 240, San Jose, Calif. 95119. Phone (408) 363-2345 or (800) 268-6082; fax (408) 363-2340.

Shana Corp. is at Advanced Technology Center, 9650 20th Ave., Suite 105, Edmonton, Alberta T6N 1G1, Canada. Phone (403) 463-3330; fax (403) 463-3343. □

OptImage's CD-IT! to work with recorder to let users create CDs on Mac desktop

By Kirsten L. Parkinson

West Des Moines, Iowa — OptImage Interactive Services Co. next month will release software that lets Mac users master CD-ROMs and audio CDs from their desktops.

With CD-IT!, users with a Philips CDD-521 recording system can create CDs by selecting a disc partition or particular files and then clicking a button to have those files burned into a disc.

The program supports the International Standards Organization 9660 standard for CD-ROMs, CD-Audio and Compact Disc-Interactive formats. A CD-Audio disc created from 16-bit AIFF (Audio Interchange File Format) files can be played on a regular CD player.

The software also offers multi-session recording as well as mixed-mode recording, which lets users

save data of different formats to a single disc.

A test dialog box lets users determine whether their Macs can transfer data fast enough to support accurate recording with the CDD-521 before actually burning a disc. CD-IT! also ships with an OptImage driver that turns the CDD-521 into a CD player, allowing users to play back discs immediately after recording.

CD-IT!All, a version of the software that supports all three formats, will cost \$2,995; CD-IT! for a single format is \$1,295.

Through Dec. 1, OptImage will bundle CD-IT!All with the Philips recorder for \$7,995.

OptImage Interactive Services Co. is at 1501 50th St., Suite 100, West Des Moines, Iowa 50266. Phone (515) 225-7000; fax (515) 225-0252. □



News

BRIEFS

TrueTime card syncs Mac with government timecode

Santa Rosa, Calif. — Mac users can perform time-specific data collection that conforms to the IRIG-B government-standard timecode with TrueTime Inc.'s Mac II-SG card.

The NuBus card lets users time-tag data acquisition to within one microsecond, far more precise than the Mac's built-in clock. Such precise timing and task synchronization is necessary for many data-acquisition and telecommunications functions.

The \$1,750 Mac II-SG can also be phase-locked to an external IRIG-B timecode input and can then act as an IRIG-B generator for other Mac II-SG cards, which guarantees the Mac is precisely set to national standard time. The Mac II-SG card is available with a module that syncs to Global Positioning System satellite data for \$2,750.

The Mac II-SG card comes with software to acquire coded time information from another host. TrueTime said customers generally write their own drivers to gather this information into custom software.

TrueTime Inc. is at 3243 Santa Rosa Ave., Santa Rosa, Calif. 95407. Phone (707) 528-1230; fax (707) 527-6640.

LaserByte OEM drive boasts 28-millisecond seek time

Sunnyvale, Calif. — LaserByte Corp. this week will unveil its first product, a 3.5-inch OEM drive that the company said offers the fastest seek time in the industry.

The LB3128 uses split-optic technology to deliver an average seek time of less than 28 milliseconds. The drive has an average latency of 8.33 milliseconds and will offer a capacity of 128 Mbytes per cartridge. With a SCSI-2 interface, the LB3128 can reach a sustained data transfer rate of 768 Kbytes per second and burst transfer rates of as much as 4 Mbytes per second.

The LB3128 is available now in sample quantities at an OEM price of \$800; volume shipping will start in the fourth quarter.

Based here, LaserByte was founded in 1990 by a group of former Verbatim Corp. and Eastman Kodak Co. employees. It is now a private company owned by its own employees and Hyundai.

Dialog CD brings environmental how-tos to desktop

Palo Alto, Calif. — Dialog Information Services Inc. this week will ship a CD-ROM of environmental chemistry data.

The Dialog OnDisc Environmental Chemistry, Health & Safety disc contains how-to articles on topics such as waste management, documenting risk assessments and identifying hazardous materials.

The CD-ROM, which includes a subscription with quarterly updates, is \$1,495. The information covers the years 1980 to the present.

Dialog Information Services Inc. is at 3460 Hillview Ave., Palo Alto, Calif. 94304. Phone (415) 858-3785 or (800) 334-2564; fax (415) 858-7069.

Read my clips.

THE BOTTOM LINE

The HP ScanJet IIc sets a new standard for affordable color scanners. Its engine is fast and well-engineered, and HP's innovative color-calibration software makes hassle-free, "true"-color scans a reality. Prices at less than \$2,000, the HP ScanJet IIc is a best buy in its class.

Top honors in every scanner category.

It's blazingly fast!



and black-and-white photos, the ScanJet IIp is an exceptional product. The scanner is just 16 inches long.

WINNING COMBINATION

To test the HP ScanJet IIc, we used the same set of tests we used for our most recent color-scanner lab report. The results showed HP's new scanner to be the best in its class in both hardware and software. The ScanJet impresses from the moment you open the box. Other

scanners use a removable screw that locks the scan head for shipping, but HP uses a locking lever that's built into the scanner itself. There's no screw to lose, and the lever is so easy to use that you'll find yourself locking the scan head more often, thereby increasing its life span.

the scan head, and color accuracy showed the HP ScanJet IIc to be a top performer. In addition to scanning at an optical resolu-

TOP-NOTCH HARDWARE TEAMED WITH INNOVATIVE SOFTWARE MAKES HP'S NEW COLOR SCANNER A WINNER.

The HP ScanJet IIc uses a one-pass scanning method that makes it one of the fastest color scanners we've seen. It also provides time-saving color previews that dynamically display any changes you make to the scan, such as exposure, hue, and saturation modification.

1992 Diamond Awards

For an all-around scanner offering high-quality color and black-and-white images, true 400-dpi resolution, and good basic scanning software, HP's ScanJet IIc can't be beat.

"We were extremely impressed..."

Hewlett-Packard's ScanJet IIp sets a new standard for affordable desktop gray-scale scanners. From its striking compact design to

We'd hate to brag. So we'll let the Mac press do it for us.

Macworld awarded both the HP ScanJet IIc and IIp their World Class Award, and named the HP ScanJet IIc as the Best Color Scanner for 1992, and the HP ScanJet IIp as the Best Black & White/Gray-Scale Scanner. While MacWeek gave their prestigious Diamond Award to the HP ScanJet IIc.

Speed. Simplicity. And accuracy were all applauded. It's no wonder. HP's single-pass scanning delivers both lightning-fast speed and precise color registration. TWAIN support allows scanning without having to switch between applications. And HP AccuPage technology with 400-dpi resolution can tackle the toughest OCR challenges. What's more, capabilities this advanced have never been this affordable. List price on the HP ScanJet IIc is just

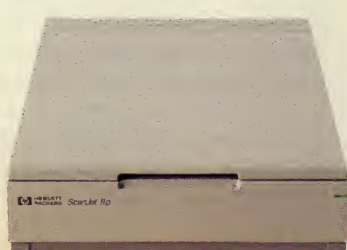
\$1,599. The HP ScanJet IIp is just \$879. And right now, the HP ScanJet IIc includes Adobe™ Photoshop LE.

Impressed? Don't just take our word for it, or even the Mac press's. Attend one of our scanning seminars that will be held April through September, 1993. To find out more about the HP ScanJet IIc and IIp or seminars in your area, call 1-800-SCANJET, Ext. 7364*. And judge for yourself.

HP ScanJet IIc



HP ScanJet IIp



**HEWLETT
PACKARD**

Management

On-line problem solving

Getting
technical
support
on-line
offers access
to a global
community
of users and
can save time
and money.

By Jeff Ubois

Busy signals, eternity hold, dollar-a-minute support fees and telephone tag cause much of the cost and aggravation of getting product support.

On-line information services can end all those problems with fast, inexpensive and accurate solutions. Through an immense variety of on-line support networks, subscribers can tap into the collective experience of millions of users worldwide. Services provide direct connections to vendors, access to a wealth of news, product announcements and software updates.

Commercial services such as AppleLink, America Online and CompuServe; user-group bulletin board systems; vendor-supported forums and bulletin boards; and Internet archive sites, news groups and mailing lists are all good sources, each for different information.

Users emphasize that on-line services affect many aspects of their support operations, from prepurchase advice giving and decision making to after-purchase support. Equally important, on-line services are better at solving problems that arise from product incompatibilities.

"You may think your problem is totally off the wall, and you can't make heads or tails of it, but the chances are that amongst the millions of people on-line, someone has a setup similar to yours and has had your problem," said Jonathan Deitch, system administrator for Turner Production Graphics, a division of Turner Broad-

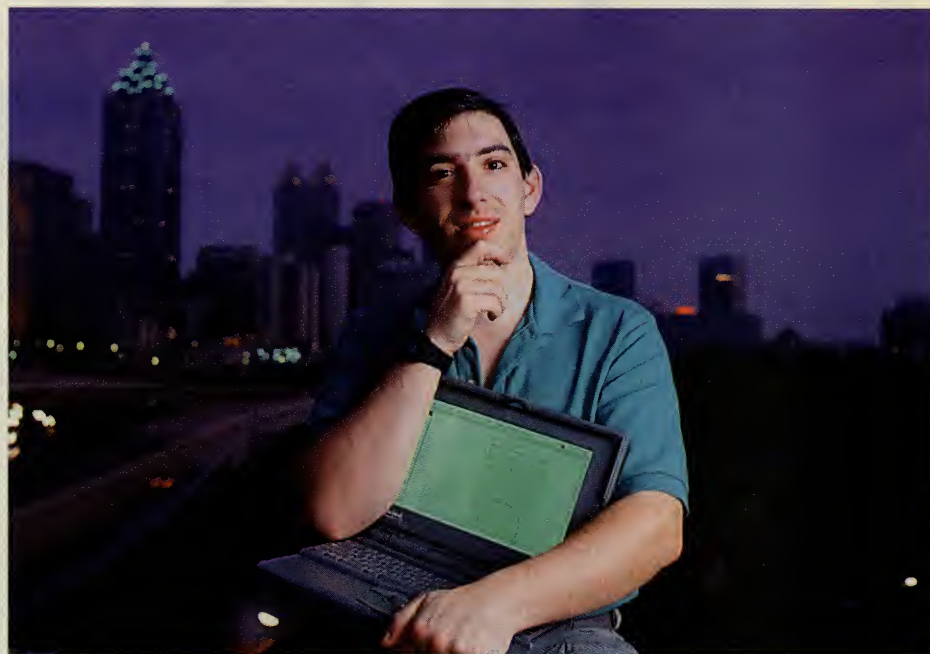
casting System Inc. of Atlanta.

Answers aren't guaranteed, but what on-line services offer at their best — access to a global community of experts — is unique.

"There's a lot of stuff you can't derive from magazines or other published material that you can get from experts," said Pat Wong, a technician at California Polytechnic State University in San Luis Obispo, Calif. "For example, we were working with MacX to run Unix workstation programs on faculty members' Macs and looked in the protocols news group [on the Internet] to see what other users' experiences have been."

For users overseas, the value of on-line services is immeasurable. "Being here in Germany, we don't have access to 800 telephone numbers, and holding on a transatlantic call is just too expensive," wrote Hans M. Aus, a research associate at the Institute of Virology at the University of Wuerzburg, Germany, in response to a query posted on a Mac Usenet group. "A student in South Korea recently helped me and another Internet user in Holland find the problem with an Ethernet card. We needed a newer version of the ROM in order to use the card with System 7.1, but first other Internet participants helped me find the successor to the original, bankrupt supplier with the disconnected fax number."

Direct vendor support. Most large software vendors offer some form of on-line support, either



ROB NELSON

through a commercial service such as AppleLink, CompuServe or AOL, or through their own bulletin board system.

For example, Microsoft Corp.'s Knowledge Base, the database used by its customer-service representatives, is available on CompuServe, GENie, Prodigy and AOL. Knowledge Base includes searchable text, device drivers, bug fixes, and references to Microsoft Press publications.

"If I had a choice between a vendor that offered support on-line and one that did not, I would take the one that did," said John Boyden, a Salt Lake City-based attorney. "I bagged a financial package because I was sick of the bad support and bought a custom package supported over electronic mail on CompuServe, and it works out really well."

Deitch emphasized that on-line support is more cost-effective than telephone support. "It takes time to

prepare a letter to a vendor. If you call, you may be on hold for 20 minutes. [With on-line support] it will take you only five to 10 minutes to type it, log in and transmit," he said.

Sending support requests to manufacturers via E-mail also makes it possible to include error logs and other files that help in diagnosing and solving problems, and lets them reply with scripts, patches, updates and other files, Deitch added.

Vendors like on-line support for the same reasons. Avi Rappoport, manager of technical support at Niles & Associates Inc. of Berkeley, Calif., publisher of EndNote and EndNote Plus, provides support via forums on CompuServe and AOL, an Internet mailing list, FTP archive site, and a Usenet group.

"This lets people send me stuff at their convenience, not mine," Rappoport said. "It's worldwide, and it's better than faxes — I can get actual problem files and test them here."

"The chances are that amongst the millions of people on-line, someone has a setup similar to yours and has had your problem," said Jonathan Deitch, a system administrator for Turner Production Graphics.

A sampling of on-line resources

AppleLink

Apple
P.O. Box 10600
Herndon, Va. 22070-0600
Phone (408) 974-3309
Fax (703) 218-6701

Apple's on-line service, AppleLink, is the most expensive of its kind at \$37 per hour, but it offers Apple's own support forum, as well as support areas for more than 400 third-party companies.

BMUG Inc.

1442-A Walnut St., No. 62
Berkeley, Calif. 94709
Phone (510) 549-2684
Fax (510) 849-9026

BMUG, a user group, maintains one of the largest Mac BBSes in the world, featuring discussion groups, vendor forums, software and archives. A \$45 yearly membership fee (which includes one hour per day of on-line time) makes BMUG a bargain.

America Online Inc. (AOL)

8619 Westwood Center Drive
Vienna, Va. 22182-2285
Phone (703) 448-8700
or (800) 827-6364
Fax (703) 883-1509

CompuServe Inc.

5000 Arlington Centre Blvd.
P.O. Box 20212
Columbus, Ohio 43220
Phone (614) 457-8600 or (800) 848-8199
Fax (614) 457-0348

GENie (owned by General Electric Co.)

P.O. Box 6403
Rockville, Md. 20850-1785
Phone (800) 638-9636

AOL, CompuServe and GENie are leaders among commercial services in the Mac community. All of them offer access to discussion groups and vendor forums.

The Internet

The mother of all networks offers access to millions of users around the world, vendor support operations, free software archives, Usenet news groups, mailing lists and other resources. Gaining access to the Internet is more complicated than accessing the other services listed here, but it is no longer the sole province of government and academic institutions. Relevant Internet resources include:

► **News groups.** For those who have access to Usenet, the Comp.Sys.Mac hierarchy, Comp.Binaries.Mac and Comp.Protocols.Appletalk are among the best.

► **Archives.** Among the biggest and most interesting archive sites for Mac users are Sumex.Stanford.Edu, Ncsa.Uiuc.Edu, Wuarchive.Wustl.Edu and Apple.Com. These offer software utilities, discussion group archives and technical documents.

► **Mailing lists.** These tend to be more narrowly focused, like Steve Holden's 4D list, but info-mac-request@sumex-aim.stanford.edu is a more general resource.

The global brain. Bug fixes aside, the most unbiased, knowledgeable advice often comes from other users.

"I wouldn't buy anything that didn't get raves on CompuServe first," Boyden said. "I learned that the hard way, but I haven't made any mistakes in purchases since I started doing that."

Wade Williams, a network support specialist in the division of university computing at Auburn (Ala.) University, relies on Internet resources for purchase decisions and solving support problems. "We check on-line first and see what people are saying about a product for almost everything we purchase," he said.

Other users can often provide support that rivals vendors'. "The support you get after purchase from other users who have encountered the same problem as you have is superb and far superior to what you can get from manufacturers and dealers," Boyden said.

Shared user experiences also save time. "Everybody else is doing the same stuff, so there's no reason to re-invent the wheel — we can't afford to do that," said Steve Holden, Macintosh applications/systems engineer at Science Applications International Corp. of San Diego. "Users want questions answered in four to five hours, and we like to provide them with the quickest solution possible."

One way some groups of users support each other is to create mailing lists on the Internet. These automatically forward and distribute E-mail among all list members. Holden, for example, helped to create a mailing list for high-end users of ACI US Inc.'s 4th Dimension. Subscribers to the list (which can be joined by E-mailing 4d_request@mit.edu) receive 10 to 20 messages a day about 4D and gain access to a community of 4D experts.

On-line services also provide access to software archives and updates. Holden, for example, regularly downloads anti-virus software from the Comp.Binaries news groups on Usenet.

Subtleties and difficulties.

The concepts and tools for on-line support are evolving rapidly.

Particularly important are tools

to help users search and navigate through on-line information. A few tools for Internet searching and navigation, such as Archie, WAIS, Veronica and Gopher, are already available, but these are oriented more toward archival information than ongoing discussions.

Another problem users report is how to organize tips, leads and information they get off-line. Holden said he keeps about 80 Mbytes of programs and data downloaded from the Internet on an indexed AppleShare server. "If users want to [grab something off the Internet] directly, it's OK, but if it's up on our server they know it has been tested and is trustworthy," he said.

Finally, with the development of new tools and forums, new norms are being established, at least in some groups. Veterans emphasize it's important not to simply post a question you could have answered yourself, especially on the Usenet groups. "Make sure you read the FAQs (the Frequently Asked Questions file posted to the group periodically) for each group so you know what has been answered," Holden said. "I'm a lot more inclined to help someone new if they've read the documentation for the group." □

Calendar of Events

JUNE

21-23 Mobile Computing Forum, Dallas. Conference for corporate end users, government consultants and systems integrators. Includes hands-on demonstrations of new mobile-computing and wireless-technology products. Contact Dataquest Inc. at (805) 298-3262 or (800) 457-8233; fax (805) 298-4388.

21-23 Netsec '93, Washington, D.C. Focuses on network security in the open environment. Telsec '93 to follow (June 24-25), including a forum on telecommunications security. Contact The Computer Security Institute at (415) 905-2626; fax (415) 905-2218.

21-25 Usenix Summer 1993 Technical Conference, Cincinnati. Two days of tutorials, followed by three days of refereed technical sessions, addressing new work on Unix-related programming and technology. Contact the Usenix Association at (714) 588-8649; fax (714) 588-9706.

22-23 Los Angeles Lap&Palmtop '93, Anaheim, Calif. Portable-computing and communications exposition and conference. Contact Laptop Expositions at (212) 682-7968; fax (212) 867-8277.

23-25 GIS Discovery Series, Fort Collins, Colo. An introduction to the concepts, issues and applications of GIS (Geographic Information Systems) in marketing. Contact GIS World Inc. at (303) 223-4848; fax (303) 223-5700.

23-26 Digital World '93, Beverly Hills, Calif. Seybold conference and showcase centering on multimedia. A cross-industry event that tracks the digital convergence. Contact Seybold Seminars at (310) 457-8500 or (800) 433-5200; fax (310) 457-8599.

29-1 Mactivity, San Jose, Calif. Three-day conference and exposition focused exclusively on Mac networking. Includes more than 50 sessions on Mac connectivity and a MacWEEK-sponsored golf tournament. Contact Winehouse Computer Co. at (408) 354-2500 or (800) 798-2928; fax (408) 354-2571.

**IF YOU'RE NOT
IN BOSTON
A DAY EARLY,
IT WILL BE
TOO LATE.**



Macintosh Volume Buyers

PRODUCT DEMO

Copley Plaza Hotel, Boston,
August 2, the day before
the Macworld show opens.

MacWEEK readers are busy. Sure, you always make time to see the latest products at the industry shows, but it's exhausting to wade through the crowds. It takes too much time searching for someone who can answer important questions about product features, system requirements, service availability, pricing.

Or, there is MacWEEK's annual MVB event in Boston. The MVB show is designed to give a limited number of MacWEEK readers the opportunity to get a close look at the latest products for the Macintosh. The most innovative Macintosh vendors will be there to demonstrate products and answer questions.

The MacWEEK MVB event will be held in Boston on August 2nd, the day before the Macworld show. The product exhibition hours are 1:30 to 4 pm, all guests are eligible for our product drawing.

The MacWEEK MVB event is the opportunity for you to make the most of your time in Boston. To reserve a ticket, please complete the form and fax it to the number indicated. Complete schedule and exact location information will be sent with your confirmation.

PLEASE FAX TO: (415) 243-3650

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

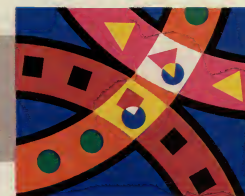
Phone () _____ Fax () _____

How long have you been a MacWEEK subscriber? _____

Have you attended a MacWEEK MVB event before? _____

How many Macs are at your site? _____

Which products or vendors are you most interested in seeing? _____



CE to ship QuickMail MHS client

Lets NetWare Macs tap MHS services

By Nathalie Welch

West Des Moines, Iowa — CE Software Inc. this month will release its long-awaited QuickMail client for Novell Inc.'s Message Handling Service.

QuickMail MHS lets Macs on Novell NetWare networks access a Novell MHS server and exchange mail with other MHS clients. QuickMail users on AppleTalk networks must still employ an MHS gateway, such as StarNine Technologies Inc.'s MailLink*MHS for QuickMail, to access Novell MHS.

QuickMail MHS, with prices ranging from \$99 for a single user to \$4,499 for a 100-user pack, includes the QuickMail MHS Account Manager server package, which resides on a Novell MHS host running NetWare. Also included is CE's QM Forms package.

► **Client.** Users of QuickMail MHS will see the familiar QuickMail interface as they create custom address books, send mail to groups of users, and file mail on their local hard drive or network server. A Verify Address feature works with the MHS directory to synchronize local hard disk- and server-based address books.

QuickMail MHS lets users attach up to 62 files and the contents of the Mac Clipboard to a single memo

and enables the user to sort Mailbox messages by priority, subject, sender, date sent, and whether they are read or unread. Voice messages can also be attached to a memo via the Mac's built-in microphone or compatible device.

A flashing icon or sound notifies users of incoming mail. Users can also post public messages to a bulletin board-type folder.

► **Administration.** The QuickMail MHS Account Manager lets administrators set and modify Mac user directory privileges and monitor mail usage.

QuickMail MHS, which supports Novell's standard messaging formats, can take advantage of third-party MHS gateways running on NetWare. It supports name caching to let multiple users share a single workstation.

Da Vinci Systems Corp. also provides Mac client software for MHS via its MacAccess 2.0 desk accessory, priced at \$395 for five users. The company will offer a Mac client to MHS in its Da Vinci eMAIL for the Macintosh, due to ship at the end of the year.

CE Software Inc. is at P.O. Box 65580, 1801 Industrial Circle, West Des Moines, Iowa 50265. Phone (515) 224-1995; fax (515) 224-4534. □

RadioMail beams messages to PBs

By April Streeter

San Mateo, Calif. — PowerBook users can untether themselves from telephone lines this week when RadioMail Corp. ships software that lets them send and receive messages via wireless modem.

For \$89 per month plus a \$99 start-up fee, RadioMail will deliver an unlimited amount of mail to and from its Internet-accessible electronic-mail

system. A version of Eudora, a shareware mail program that serves as the Mac's interface to RadioMail, is included for an additional \$49. A wireless modem, which costs \$775, is also required.

Subscribers receive a mailbox that lets them send messages anywhere that the RAM Mobile Data or, starting in August, Ardis Co. networks operate. Users are not required to subscribe to those services, and they receive only one bill from RadioMail. The company said it will offer connections via the Cellular Digital Packet Data network once it is working later this year.

A proprietary protocol called the RadioMail Transport sits on top of the Ardis and RAM transport mechanisms to deliver messages.

RadioMail's gateway handles message translation between dissimilar services so that a user can send a message to an MCI Mail or CompuServe user without subscribing to those services.

"It's convenient to have your mailbox with you wherever you go," said beta-tester Bill Hines, vice president of engineering at Bear, Stearns & Co. in New York. "We have [Lotus Development Corp.'s] cc:Mail Remote, but you still have to find a dial-in line. If your message traffic is very important to you, this is one way to get it when you are on the road."

See RadioMail, Page 20

Eudora for sale

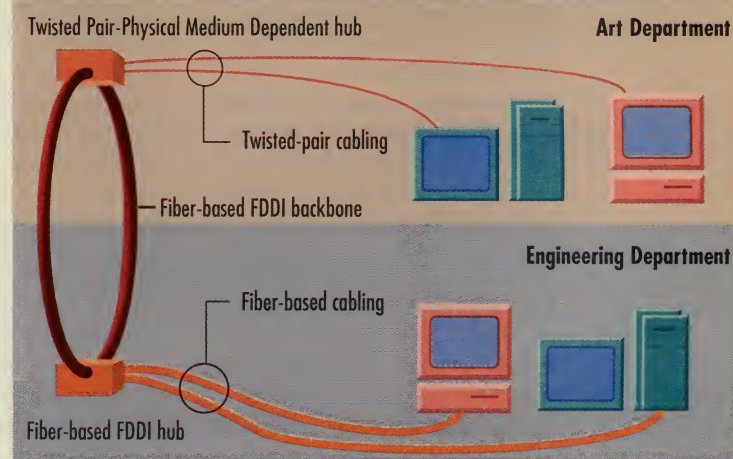
Eudora, the popular shareware Mac Internet mail client, is going commercial.

Next month Eudora will appear as a shrink-wrapped product distributed by software vendor Qualcomm Inc. of San Diego. Qualcomm last week declined to give the price of the forthcoming product, but RadioMail Corp. said it will sell Eudora for \$49.

It is not known whether Eudora will still be available as shareware after Qualcomm starts selling it.

Eudora, written by Steve Dorner of the University of Illinois at Urbana, lets users create, edit and read mail messages offline and supports dial-up or LAN Internet connections. It also lets users attach files to their mail messages.

A mix-and-match FDDI network



NEVIN BERGER

Cabletron, Codenoll announce Mac adapters for copper FDDI

By April Streeter

San Francisco — A derivative of Fiber Distributed Data Interface is on the horizon for Mac managers eager to boost network bandwidth without replacing their copper cabling.

Cabletron Systems Inc. and Codenoll Technology Corp. this month announced Mac adapter cards for a 100-Mbps FDDI-based network standard known as Twisted Pair-Physical Medium Dependent (TP-PMD).

TP-PMD, under consideration by the American National Standards Institute, will compete with two other 100-Mbps Ethernet standards being developed by Hewlett-Packard Co. and Grand Junction Networks Inc. TP-PMD uses Category 5 data-grade cable, the highest quality and most expensive unshielded twisted-pair (UTP) wiring choice.

The cards from Cabletron and Codenoll will let NuBus Macs connect via UTP to an FDDI/UTP concentrator from any vendor supporting the TP-PMD standard. Cabletron's F6019 card will be available in the third quarter for \$1,395. Codenoll said it will deliver its CodeNet FDDI NuBus card for about the same price but has not announced availability.

Because of speed limitations in the Mac, Codenoll said, managers can expect individual Macs on an FDDI/UTP network to achieve about 10 to 15 Mbps throughput to the hub. In contrast to Ethernet, however, multiple Macs on TP-PMD can achieve that throughput without bogging down the network.

The TP-PMD standard is similar to the Copper Distributed Data Interface (CDDI) standard touted and trademarked by Crescendo Communications Inc. of Sunnyvale, Calif. But CDDI is no longer being considered by ANSI, and Crescendo plans to support TP-PMD in future products.

Cabletron Systems Inc. is at 35 Industrial Way, Rochester, N.H. 03867. Phone (603) 332-9400; fax (603) 332-7386.

Codenoll Technology Corp. is at 1086 N. Broadway, Yonkers, N.Y. 10701. Phone (914) 965-6300; fax (914) 965-9811. □

DEC delivers TeamLinks for Mac

By Nathalie Welch

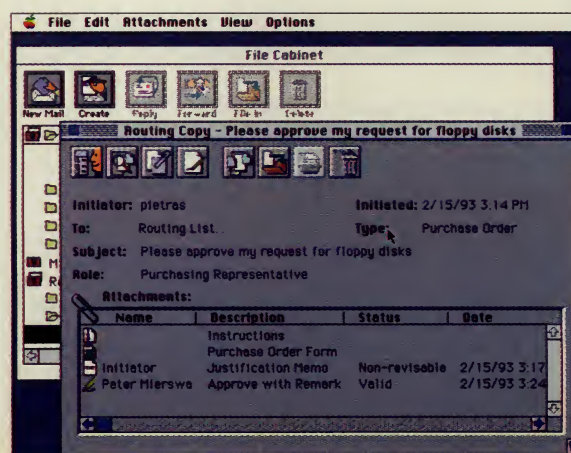
Maynard, Mass. — Digital Equipment Corp. this month will ship TeamLinks groupware for the Macintosh, including an upgraded client to DEC MAILworks and new work-flow and conferencing software.

TeamLinks is a suite of mail-based programs designed to inte-

grate Pathworks clients into DEC electronic-mail backbones. The new Mac products are:

► **TeamLinks Mail for Macintosh 1.2.** DEC changed the name and improved the interface of its previously available X.400 client, DEC MAILworks for Macintosh, to fit it under the TeamLinks umbrella.

See TeamLinks, Page 20



Using a distribution list, TeamLinks Routing lets Mac users send a single message to more than one person; each person can be assigned a specific role, such as the capability to read only or modify enclosed documents.

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Asanté now takes Ethernet all the way to your laser printer.

The proven leader in Macintosh® networking now offers more Ethernet® solutions than ever. Introducing AsantéPrint™, the simplest way to connect up to 2 LocalTalk™ laser printers or other devices directly to a high-speed Ethernet network.

The reliable EtherTalk to LocalTalk converter.

AsantéPrint has no switches to set or installation software to load, so it works right out of the box. And, unlike other converters of its kind, AsantéPrint has no necessary power-up sequence. Because of this, it's the only EtherTalk-to-LocalTalk converter that is capable of unattended recovery after a power outage.

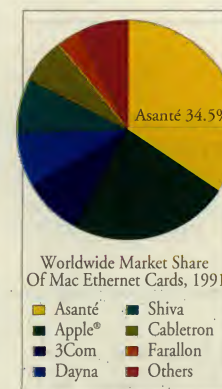
AsantéPrint is so simple, it's perfect for small networks. It's also ideal for more sophisticated networks when combined with AsantéPrint management software. This combination offers you management and security features which provide an unparalleled level of control over all your Ethernet and LocalTalk connections.

The security software assigns passwords to any or all of your connected LocalTalk devices, and even allows you to specify passwords for specific LocalTalk classes such as color printers or dial-out modems. So you can protect peripherals from unauthorized or accidental access.

Asanté. All the right connections.

Asanté™ has a reputation for producing compatible, reliable networking products. We offer a full family of best-selling Ethernet and Token Ring® adapter cards for PCs and Macs®. And a full line of intelligent and non-intelligent 10BaseT hubs. Now we're taking Ethernet all the way to your laser printer.

AsantéPrint. The latest innovation in Ethernet solutions from the company with all the right connections.



Source: International Data Corporation, June 1992



Resellers: Asanté products are available from Ingram Micro, Merisel and Tech Data.

WordPerfect delivers Office 4.0

Program integrates E-mail, calendars

By Nathalie Welch

Orem, Utah — WordPerfect Corp. this week is shipping its latest electronic-mail package, sporting newly integrated calendaring and task-scheduling functions.

WordPerfect Office 4.0 lets users send E-mail, schedule tasks, and access personal or group calendars without having to launch separate applications (see MacWEEK, Oct. 12, 1992).

Client packages for Macintosh, DOS and Windows platforms are \$495 for five users. Servers reside on DOS or OS/2 and cost \$295. Unix and NLM (NetWare Loadable Module) servers are expected to ship in the third quarter, and a Mac server is due by the end of the year.

"It's tremendous to have it all organized into one application," said Robert Warnick, network administrator at Iomega Corp. of Roy, Utah. "It was cumbersome for Mac users to stay aware of every-



thing going on when they had to access separate applications."

One beta tester, however, said it could take users some time to enjoy the benefits of integration.

"I think that it is convenient, but I also think there is a learning curve associated with it," said Pamela Stevens, support system analyst at the University of Arizona in Tucson. "Most average users will have to make a conceptual jump to take advantage of it because it's so different than what they have access to now."

Among the highlights of WordPerfect Office 4.0 are:

► **Rules.** Office now lets users predefine automatic actions (such as forward, reply, reject and delegate) based on the words in incoming electronic mail, schedule requests or personal calendaring messages.

► **Forms and work flow.** The ability to route electronic forms via Office 4.0 will be possible when the \$199 Mac version of the Filler portion of InForms, its electronic forms package, ships later this year (see MacWEEK, May 24).

"Office 4.0 has some wonderful features, such as the ability to proxy," Stevens said, "but the Mac version still lacks features found on the PC side, such as remote access and the ability to save personal address books from SMTP (Simple Mail Transfer Protocol) users."

► **Administration.** The program offers either centralized or decentralized administration as well as a fully distributed directory service database with directory synchronization.

"I really like the fact that files from Mac, PC and Unix machines can reside on one server and that all administration is centralized," Warnick said.

Upgrades from Version 3.1 are \$105 for a server and \$179 for a five-pack of clients.

WordPerfect Corp. is at 1555 N. Technology Way, Orem, Utah 84057-2399. Phone (801) 228-5037; fax (801) 228-5077. □

WordPerfect Office 4.0's calendaring feature lets users grant others access to their personal data. Authorized users can then retrieve and view several users' calendars side by side.

Apple MacX.400 servers to allow E-mail transmission over TCP/IP

By Nathalie Welch

Cupertino, Calif. — Apple is enhancing its MacX.400 electronic-mail servers to allow them to transfer messages on TCP/IP networks.

At the Electronic Messaging '93 Expo in Atlanta this week, Apple will reveal the details of its MacX.400 1.1 and MacX.400 SD (Single Domain) 1.1 servers. Due late this summer, the new servers will include an upgraded OSI Connection for Macintosh 1.1, which contains an RFC 1006-compatible module for running Open Systems Interconnection (OSI) services, such as X.400 messaging, over TCP/IP networks. The OSI software will be available separately for \$199.

Previous versions of the X.400 servers required X.25 connections and supported Ethernet connections only through OSI routers.

Apple will also announce that by mid-1994 it plans to support the fledgling Asynchronous Protocol Specification, which enables X.400 traffic to be transferred over dial-up telephone connections.

Apple is offering a MacX.400 application programming interface with the new versions to let third-party developers create X.400 gateways from MacX.400 to existing E-mail systems and to create X.400 client software for the Mac.

MacX.400 1.1 will be priced at \$4,950, and MacX.400 SD will cost \$2,950. Upgrades will be free. □

Sonic expands bridge options

By April Streeter

Sunnyvale, Calif. — Sonic Systems Inc. this week is upgrading its software bridges to let users connect more LocalTalk devices to an Ethernet, token-ring or Fiber Distributed Data Interface network.

SuperBridge 3.0, priced at \$249, now lets a Macintosh with an appropriate adapter card serve as a bridge between LocalTalk devices and Ethernet, token-ring or FDDI networks. Version 3.0 will link as many as 10 devices daisy-chained from the Mac's LocalTalk port.

LaserBridge 3.0, priced at \$199, provides the bridge for 10 LocalTalk printers. Previously the bridges supported only Ethernet and only five devices.

A third product, the \$149 PowerBridge 3.0, connects just one

device but adds the new token-ring and FDDI support. All three products also bridge LocalTalk to ISDN (Integrated Services Digital Network).

The LocalTalk devices can be seen and accessed by other networked Macs via the Chooser.

PowerBridge 3.0 and SuperBridge 3.0 are available in TCP/IP versions for \$249 and \$349, respectively.

Version 3.0 upgrades are \$49. Sonic Systems Inc. is at 333 W. El Camino Real, Suite 280, Sunnyvale, Calif. 94087. Phone (408) 736-1900 or (800) 535-0725; fax (408) 736-7228. □

Sonic's bridge alternatives

PRODUCT	NO. OF DEVICES	SUPPORTS	PRICE
SuperBridge*	10	All LocalTalk devices	\$249
PowerBridge*	1	Single LocalTalk device	\$149
LaserBridge	10	LocalTalk printers	\$199

*TCP/IP version available.

Kalpana ups EtherSwitch to 20 Mbps

By April Streeter

Palo Alto, Calif. — Kalpana Inc. this month announced a new version of its 10BASE T switch that can boost the bandwidth between two Ethernet segments to 20 Mbps.

Kalpana will upgrade its \$3,500 EtherSwitch EPS-500 line to support full-duplex Ethernet, which will enable two EPS-500 switches to simultaneously send and receive

packets with each other at 10 Mbps in each direction. An EPS-500 with full-duplex and SNMP (Simple Network Management Protocol) support will ship in the third quarter for \$4,200. A plug-in card that provides full duplex for Kalpana's larger EPS-1500 will ship at the same time for \$975.

To avoid packet collisions, Ethernet normally functions at half duplex, which means a server or hub may either send or receive data but not do both simultaneously. A regular EtherSwitch connected to a server or a hub dedicates bandwidth for a transmission but does not provide for two-way transmissions.

The company said the new switches create a full-duplex path on which a single twisted-pair segment may either send or receive without collisions.

At first, full duplex will function only between two directly connected EtherSwitches, but Kalpana said that by the end of the year, third-party vendors will deliver full-duplex Ethernet adapters to facilitate switch-to-server connections.

Kalpana Inc. is at 1154 E. Arques Ave., Sunnyvale, Calif. 94086. Phone (408) 749-1600; fax (408) 749-1690. □

RadioMail

From Page 18

"Of course, then it's just one more thing a traveling executive has to carry around," Hines said, referring to the 1-pound wireless modem from Ericsson Mobile Communications Inc. or Motorola Corp. that is currently required to get the service.

By sending a four-letter request to the RadioMail gateway, users also receive, as part of their subscription, news headlines culled from a variety of news wires such as United Press International and Pacific Rim News Network. Dow Jones stock quotes are also available.

RadioMail Corp. is at 2600 Campus Drive, San Mateo, Calif. 94403. Phone (415) 286-7800 or (800) 597-6245; fax (415) 286-7801. □

TeamLinks

From Page 18

Providing users with the capability to attach Mac files, the package starts at \$49 per user. Access to DEC's ALL-IN-1 office-integration package and VMSmail is possible via DEC's VAX Message Router, starting at \$500.

► **TeamLinks Routing for Macintosh.** With prices starting at \$80 per user, this new package provides Pathworks for Mac users with cross-platform work-flow functions. Users create a routing tem-

plate to send a message and its attachments to a predetermined group of people on the network. The originator can assign intended receivers of the message the capability to read only, modify documents or electronically sign documents via a password-protected function.

► **TeamLinks Office for Macintosh.** For \$270 per user, this package provides users with conferencing software, in addition to TeamLinks mail and routing.

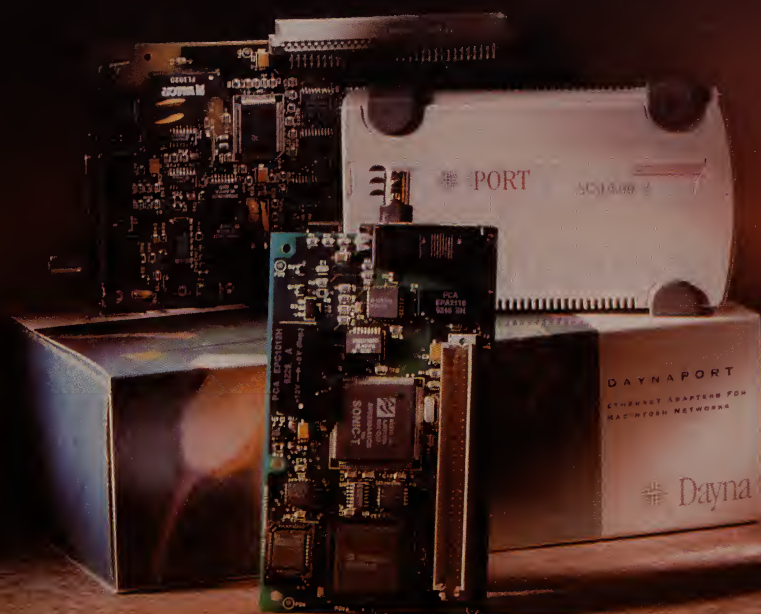
The conferencing software lets Mac clients access DEC Notes serv-

er software, formerly called VAX Notes. Users can have two conferences open simultaneously, each with as many as 50,000 topics, and employ a search function to find messages.

DEC also released Version 2.0 of both TeamLinks Mail for Windows, priced at \$49 per user, and TeamLinks Routing for Windows, priced at \$160 per user.

Digital Equipment Corp. is at 146 Main St., Maynard, Mass. 01754. Phone (508) 493-5111; fax (508) 493-8780. □

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3-in-1 Ethernet connectors	✓	✓
Media compatibility guarantee	✓	
SCSI Ethernet adapter	✓	✓
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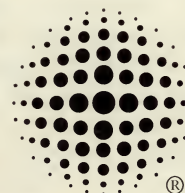
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Macintosh Networking Specialists



PainterX2 sets selections afloat

Improves color sets, speed, Frisket controls

By Neil McManus

Aptos, Calif. — Fractal Design Corp. next week will ship an extension to Painter 2.0 that will let users work with multiple floating selections.

Fractal Design PainterX2 is a \$149 add-on to Fractal's \$399 natural-media painting application. It's available at an introductory price of \$79 until Sept. 30.

In addition to floating selections, PainterX2 improves Painter's color sets, speed and Frisket controls.

With PainterX2, each selection has its own mask layer. Users can paint into, around or under a selection, as well as scale, rotate and dis-



Fractal Design PainterX2 comes with a Floating Selections palette that lists selections by layer as well as controls grouping, opacity, feathering and masking of selections.

tort it. Selections can also be manipulated with Painter effects or third-party filters for Adobe Photoshop. A new Selection Pointer tool lets users select and move floating selections.

A floating selections palette controls layering, opacity, feathering and

masking. It also lists selections by layer and lets users group selections so they can be moved or modified at one time. All selections are maintained when a file is saved in Fractal's RIFF format, allowing users to work with them when the file is reopened.

Users can also move selections and images into and out of libraries, called Portfolios. Selections can be named in Portfolios, and a thumbnail view of each image is automatically created for easy identification. A Portfolio item expands to full size when it is dragged onto an image, and a thumbnail copy remains in the library.

See *PainterX2*, Page 24

Strata to round out animation line

By Carolyn Said

St. George, Utah — Strata Inc. is readying an expert-level 3-D animation package that it said will let users create whiz-bang special effects.

Strata StudioPro, due by August for less than \$1,500, will offer modeling, rendering and animation features.

StudioPro's open software architecture will let users add plug-ins,

including Adobe Photoshop filters. Strata said it will bundle special-effects extensions, such as one called Atomize, which lets users break an image into small pieces and animate each piece individually. Several third parties are developing extensions, the company said.

StudioPro will employ 3-D splines and event-based animation. It will let users save creations as PICT, TIFF, PICS, QuickTime, DXF (Drawing Interchange File) or Encapsulated PostScript files. StudioPro files will support alpha channels, allowing users to do photo- and video-compositing in other applications.

"It's a very powerful program," said beta-tester John Nyquist, a consultant designer with Synapse Design Inc. of Des Plaines, Ill. Nyquist said he likes the fact that StudioPro combines modeling, rendering and animation in one program because using different modules can cause compatibility problems.

The program's event-based approach to animation is easier to work with than keyframe-based methods, Nyquist said. He also praised features such as berth and depth markers for objects and the visible spline paths for placing objects.

Strata Inc. is at 2 W. St. George Blvd., Ancestor Square, Suite 2100, St. George, Utah 84770. Phone (801) 628-5218; fax (801) 628-9756. □



Marco Patrito used an early version of Strata StudioPro to create this image. Patrito is creating an electronic comic book called "Sinkha."

Kodak, SuperMac introduce low-cost dye-sub color printers

By Matthew Rothenberg

Rochester, N.Y. — Eastman Kodak Co. and SuperMac Technology Inc. last week cut the cost of continuous-tone color output with new dye-sublimation printers.

► The Kodak ColorEase PS Printer, available now for \$7,999, outputs 300-dpi, 24-bit-color or eight-bit gray-scale images to letter- or A4-size coated paper or transparencies. The device can print a page in three-and-a-half minutes.

It features Adobe PostScript Level 2 and comes with Mac and Windows drivers. The ColorEase PS offers simultaneously active LocalTalk, Centronics parallel and RS-232 serial interfaces as well as a SCSI port for a hard disk. An EtherTalk interface is \$495.

The ColorEase PS is based on a proprietary engine. It includes a 40-MHz SPARC RISC processor and 16 Mbytes of RAM, which cannot be expanded. It also includes a 100-sheet input tray and a 120-Mbyte hard disk, 70 Mbytes of which can be used like a memory buffer. Kodak began distributing the printer in Europe this March (see MacWEEK, April 5).

► The Kodak XLS 8300, due to ship next month for \$10,995, is a dye-sublimation printer that outputs 300-dpi, 24-bit-color CMY (cyan, magenta, yellow) or eight-bit gray-scale images measuring up to 8.5 by 10 inches to Kodak Ektatherm print paper or transparency material. It can print a color page in a little more than three minutes, Kodak said.

The printer uses a proprietary engine and runs on a 40-MHz SPARC RISC chip with 16 Mbytes of RAM. It comes with a SCSI interface and a 100-sheet input tray. The XLS 8300 does not include a PostScript rasterizer.

The XLS 8300 joins Kodak's XL line of dye-sublimation printers, which also includes the XL 7700 and XLT 7720 (see MacWEEK, June 8, 1992).

► The SuperMac ProofPositive family of dye-sublimation printers, which includes letter- and tabloid-size models, shipped last week. The ProofPositive Full-Page Printing System, which starts at \$10,499, prints images measuring up to 8.5 by 12.3 inches. The ProofPositive

See *Printers*, Page 24

CA to spring Cricket Presents III at August expo

Upgrade will import QuickTime, AIFF

By Lisa Picarille

Islandia, N.Y. — Computer Associates International Inc. is readying a System 7-savvy, QuickTime-compatible upgrade to its presentation-graphics program.

The company said it will unveil CA-Cricket Presents III at August's Macworld Expo in Boston and ship it this fall.

The new version of the \$199 program will ship with a runtime player that allows users to distribute presentations to colleagues who don't own the program.

The upgrade lets users import snd and AIFF (Audio Interchange File Format) sound files and drop them into individual frames or an entire presentation.

CA-Cricket Presents III will also let users control sound files' dura-

tion and order of playback; set foreground and background volume; and select left, right, foreground and background channels.

The upgrade offers additional user-definable transition effects, and users can create a broader range of background blends, such as radial and user-defined diagonal blends.

New dithering algorithms use the

System palette to display background blends on Macs with four-bit color displays, such as Classics and PowerBooks.

The company said upgrade pricing has not been determined.

Computer Associates International Inc. is at 1 Computer Associates Plaza, Islandia, N.Y. 11788-7000. Phone (516) 342-5224; fax (516) 342-5329. □



CA-Cricket Presents III offers support for QuickTime movies. It has a handful of new options for creating more sophisticated background blends.

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Publishing products hit Paris show

By Raines Cohen

Paris — This month marked the first-ever Seybold Paris conference, and several Mac vendors took the opportunity to unveil their latest publishing and drawing products.

► **Nine Bits** shipped CheckPost, a \$230 imagesetter-proofing application that lets

users of lower-end PostScript printers simulate output from several common image-setters. The program can verify the fonts used in the file, save a copy that omits selected fonts, change file parameters and download PostScript files to the printer.

Nine Bits also showed Printdirector, a new

print server due to ship in November for less than \$3,000. Printdirector will let network administrators route documents to several printers, control user access, provide accounting and position pages to maximize use of film.

Users can search for fonts, images and forms via a centralized library of printing resources, which features a Finder-like interface.

► **Iteido Software GmbH** showed an upgrade to IsoDraw, the company's isometric drawing application. Version 2.6, due in July,

includes enhancements to the program's layer-management, label-export and format-conversion features. IsoDraw retails for about \$4,200 (see MacWEEK, April 5).

► **Compumation Inc.** showed two newly released Pro-Pak extensions for its Color Central servers. The \$500 Kodak Photo CD Pro-Pak lets users place Photo CD images into documents as low-resolution previews and substitutes a higher-resolution image when the document is printed, conserving disk space and reducing network traffic. It notifies the Color Central server of Photo CD images in documents as they enter the print queue, allowing the server to start decompression early so the document can be ready when the printer is free.

The Scitex CT & APR Pro-Pak, priced at \$2,000, will let users place low-resolution samples of high-resolution Scitex CT images in Mac documents and print them at full resolution.

Nine Bits is at Allégade 8 H, 2000 Frederiksberg, Denmark. Phone (45) 31 23 18 14; fax (45) 31 21 27 97.

Iteido Software GmbH is at Markt 21, D-5200 Siegburg, Germany. Phone (49) 22 41 6 88 41; fax (49) 22 41 6 79 55.

Compumation Inc. is at 100 N. Patterson St., State College, Pa. 16801. Phone (814) 238-2120; fax (814) 238-2246. □

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The difference is when you really open them up.

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Ours.
Dense foam-wrapped handle for a secure and comfortable grip.

Theirs.
No foam-wrapping on handle. Will dig into your skin when carrying heavier loads.

Ours.
PVC coating makes case both durable and water-resistant.

Theirs.
No PVC coating means less protection.

Ours.
A hard, yet flexible PVC support and wire frame protect contents from puncture damage while keeping the case from losing its shape.

Theirs.
No PVC support. No wire frame. Just cardboard lining for minimum support and protection.



KENSINGTON

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Printers

From Page 22

Two-Page Printing System can output images measuring up to 11.8 by 17.2 inches and starts at \$19,499.

Both printers come with Adobe's CPSI (Configurable PostScript Software Interpreter) PostScript Level 2 software rasterizer. They output 300-dpi, full-bleed pages in CMY or CMYK (cyan, magenta, yellow, black). Print speeds are about seven minutes per page, according to the company.

The SuperMac devices originally had been slated to ship in January.

Eastman Kodak Co. is at 343 State St., Rochester, N.Y. 14650. Phone (716) 724-4000 or (800) 344-0006.

SuperMac Technology Inc. is at 485 Potrero Ave., Sunnyvale, Calif. 94086. Phone (408) 245-2202; fax (408) 735-7250. □

PainterX2

From Page 22

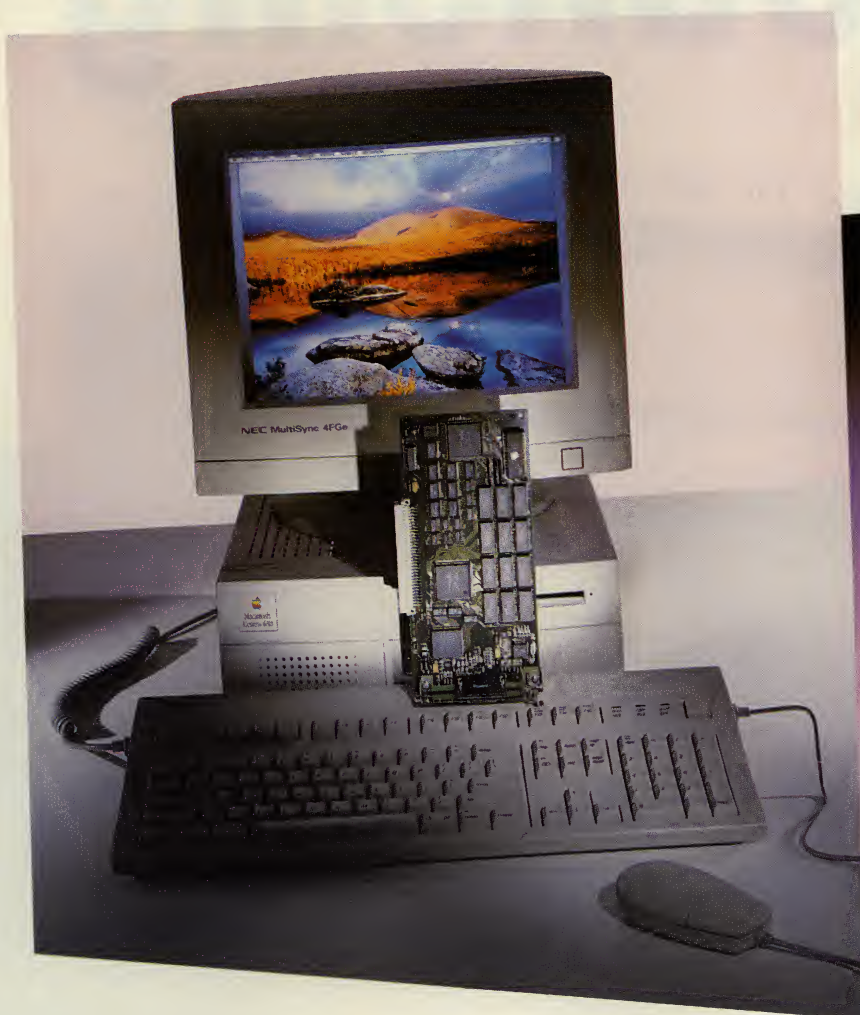
Todd Reublin, creative director at Electric Paint of Hollywood, Calif., said PainterX2's multiple floating selections save him a lot of time. "It's like cutting pictures out of a magazine and moving them around on a board. It's that fast," Reublin said. "We're constantly redoing movie posters for our clients. X2 lets us rearrange elements in minutes instead of hours."

PainterX2 lets users build their own color palettes, which can be created and modified within a text editor. Each color in a color set can be labeled, a feature aimed at animators or designers who must maintain consistent color sets. PainterX2 comes with a Pantone Matching System color set.

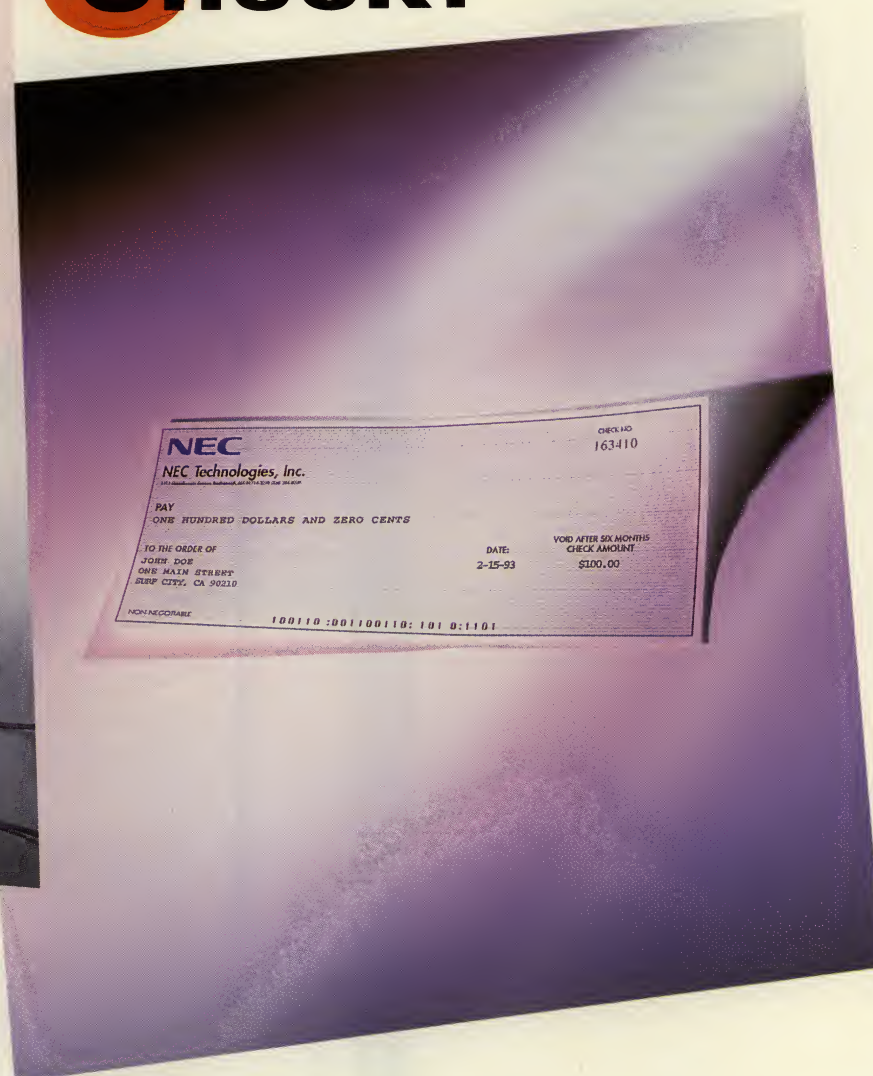
In addition, PainterX2 users can turn any image into a frisket and paint directly into friskets. PainterX2 also captures twice the samples from graphics tablets twice as fast.

Fractal Design Corp. is at 335 Spreckels Drive, Suite F, Aptos, Calif. 95003. Phone (408) 688-5300; fax (408) 688-8836. □

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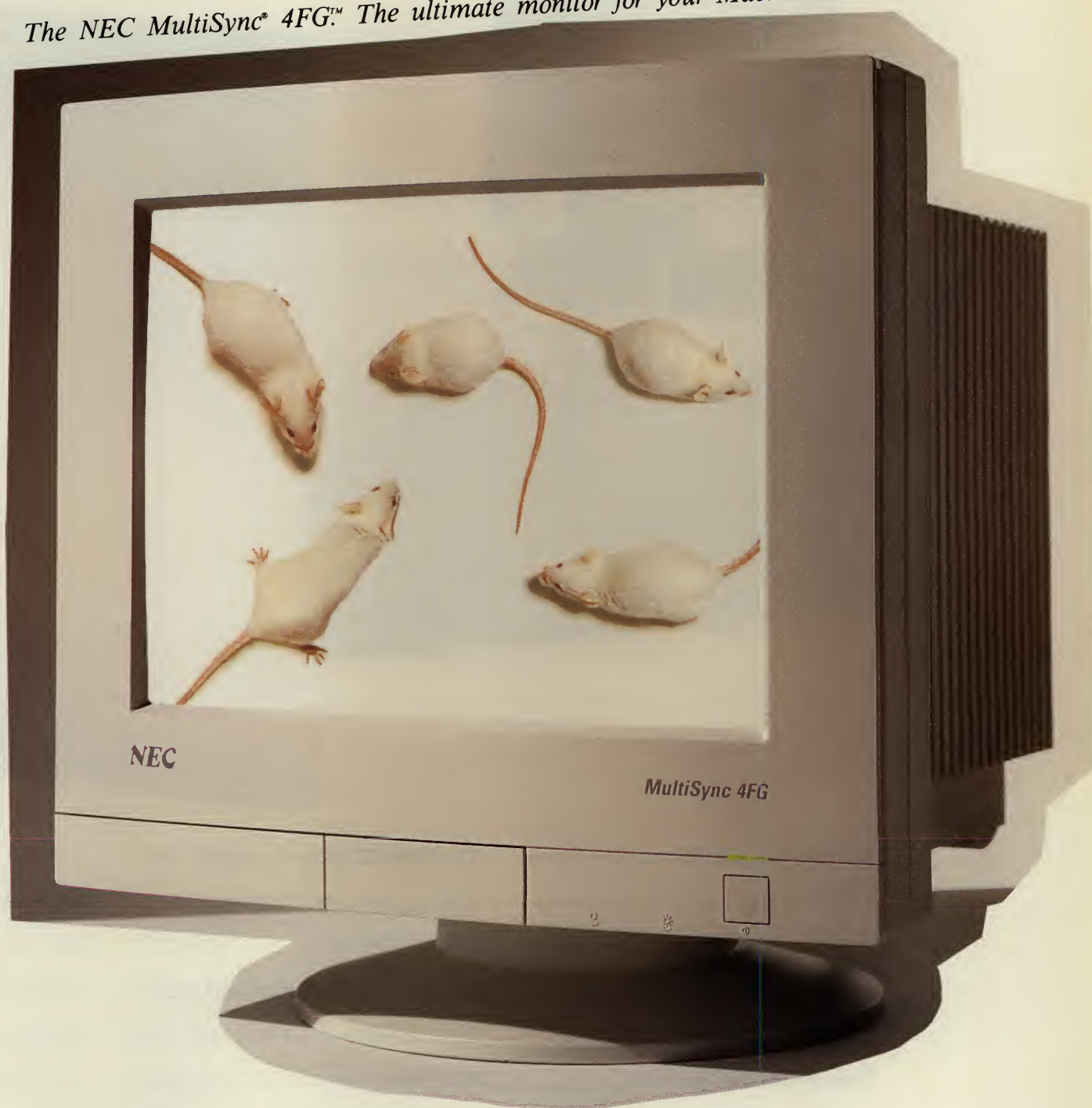
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Announcing a

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*-MacUser Magazine
Aug. '92*

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In 1992, the only monitor to snag the coveted five-mice rating was an NEC monitor: the MultiSync 4FG. After running it and 13 others through the most rigorous technical evaluation they'd ever used for testing monitors, *MacUser* magazine concluded, "If you're looking for the sharpest display, the NEC MultiSync 4FG should be your top choice." What more can we say? Glad you asked.

Our **AccuColor™ Control System** prompted *MacUser* to make special mention of the "easy color adjustments." AccuColor lets you adjust on-screen colors, so if you're looking for mouse-tail pink, that's what you'll get.

If, however, color control is not a priority for you, you'll be very happy with NEC's MultiSync 3FGx monitor, which shares almost all of the 4FG's award-winning features. Both monitors produce sharp, bright images, crisp graphics and vibrant colors. An Invar shadow mask provides increased brightness without loss of focus.

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*For Macintosh 640 x 480 resolution, just attach NEC's FG/Mac cable adapter and plug into: Macintosh IIfx, LC, LCII, IIfx, IIfx, Quadra™ 700, Quadra 900, Quadra 950, Performa™ 400, Performa 600, PowerBook™ 160, PowerBook 180, and the PowerBook 210 and PowerBook 230 with either the DuoDock™ or MiniDock™. Or with an add-in video card: Macintosh II, IIfx, IIfx, PowerBook 140, PowerBook 145, and PowerBook 170. Get the 640 x 480 FG/Mac adapter free by calling NEC at (312) 622-7427 8:30AM-5PM CST.

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The Refrigerator 1913



NEC MultiSpin CD-ROM Reader 1992

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both the MultiSpin 74 and 84 have a 256 KB continuous flow cache that allows them to transfer encyclopedias of data at high speeds and play

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MultiSpin technology, you'll find everything else about as primitive as sending mail through the pony express. To find out more, call 1-800-NEC-INFO (in Canada 1-800-343-4418). Or, via fax, call NEC FastFacts™ at 1-800-366-0476, request 23766.



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In 1985 NEC redefined monitors with the invention of MultiSync® technology. Now there is MultiSpin. The technology that has redefined CD-ROM readers.

News Analysis

Lossy compression standards have extra squeeze appeal

JPEG,
MPEG and
related
technologies
maximize
graphics
compression.

By Connie Guglielmo

One way to tell that a graphics standard has become important is when developers start touting support for that standard as a major new product feature. When it comes to graphics compression, Macintosh developers today are talking about standards such as JPEG and MPEG and technologies such as Apple's QuickTime, Intel Corp.'s Indeo, SuperMac Technology Inc.'s Compact Video and Eastman Kodak Co.'s Photo CD.

Some of the compression technologies are specifically designed to handle continuous-tone-color still images, while others were developed for putting the squeeze on motion video and animation.

Common ground. Most compression schemes are lossy, meaning they lose some image data during the compression process. The amount of data loss depends on the complexity of the original image and the compression ratio selected. The higher the compression ratio,

the more data lost. Which compression ratio you choose depends, mainly, on four things: image type; your desired resolution, which in turn depends on the context in which you'll use the image; the amount of storage space available; and the processing capabilities of your storage and playback devices.

Still de facto standard.

Over the past few years JPEG (Joint Photographic Experts Group) has become the de facto standard for compression of continuous-tone-color images. It is a Discrete Cosine Transform-based algorithm that removes redundant image and color data.

What is redundant data? Studies of human perception have proven that when viewing color images, for instance, the eye more readily notices changes in brightness (luminance) than changes in color (chrominance); JPEG takes advantage of that fact and, during compression, eliminates more chrominance than luminance information.

While there are lossless compression applications that lose no data during the compression-decompression process, these generally offer low compression ratios and allow you to reduce images at ratios in a range of 1.5-to-1 to 4-to-1. (These applications — such as Aladdin Systems Inc.'s StuffIt Deluxe and Fifth Generation Systems Inc.'s DiskDoubler — are more commonly used to compress text files or software programs for which even one missing pixel is unacceptable.)

In contrast, JPEG can compress images at ratios of about 20-to-1 with no noticeable loss of quality. Compression ratios of up to 100-to-1 are possible, but the higher the ratio the greater the loss of detail and, sometimes, the more likely the appearance of "artifacts" — shadowy areas or grainy pixels.

The best compression ratio is truly in the eye of the beholder. "The question is whether the artifacts are visible to the human eye," said Tony Bove, editor of Bove & Rhodes Inside Report on Publishing and Multimedia in Gualala, Calif. By that measure, Bove said, more graphics users are working with compression technology.

J. Fred Decker of J. Fred Graphics in San Francisco uses Storm Technology Inc.'s JPEG-based PicturePress accelerator board with an Adobe Photoshop plug-in. The results have sold Decker on com-

pression. "For any practical purpose, JPEG is great," Decker said. "I have limited hard disk space, and I hate to load things off SyQuest [cartridges]. And I don't feel I'm cheating anybody when I compress."

But there are a few instances when JPEG can put your images in trouble, Decker said. "When you have a 640-by-480-pixel image that you are looking at on a high-resolution monitor, you're actually viewing the pixels one-to-one, and you'll find JPEG artifacts at anything except the highest resolutions (lowest-compression ratios)."

JPEG artifacts are also more noticeable in images "with hard, angular edges and highly contrasting areas of color — for instance, a yellow billboard against a green background," Decker said. "If you look at the edges and you use a high-compression [ratio], you're guaranteed that you'll produce artifacts in those areas."

Decker also noted that, although artifacts may appear in an image after compression, they may not be easily visible. "If you have an impressionist image, you might not notice them even if they're there. I buy into the argument that if you can't see it, don't worry about it."

There are some situations in which higher ratios, and therefore lower-resolution versions of an image, can be used. Bob Schlowsky, principal of Schlowsky Photography in Weston, Mass., uses compressed versions of his photos for position-only placement and transmitting rough copies via modem.

Another advantage of JPEG is that it is a symmetrical compression algorithm: The same hardware or software can be used to compress and decompress an image. In addition, compression and decompression times are about the same. This does not hold true for most video-compression schemes, which are asymmetrical.

JPEG still-image compression hardware and software products are available from the following companies: Radius Inc. of San Jose, Calif.; RasterOps Corp. of Santa Clara, Calif.; SuperMac of Sunnyvale, Calif.; C-Cube Microsystems of Milpitas, Calif.; DayStar Digital Inc. of Flowery Branch, Ga.; and LSI Logic Inc. of Milpitas, Calif. Board implementations of JPEG reduce compression and decompression times to less than one second, while software-only JPEG

Because JPEG is a symmetrical compression algorithm, the same hardware or software can be used to compress and decompress an image.

SCREEN TEST

American Film Institute extends resources to youths at risk

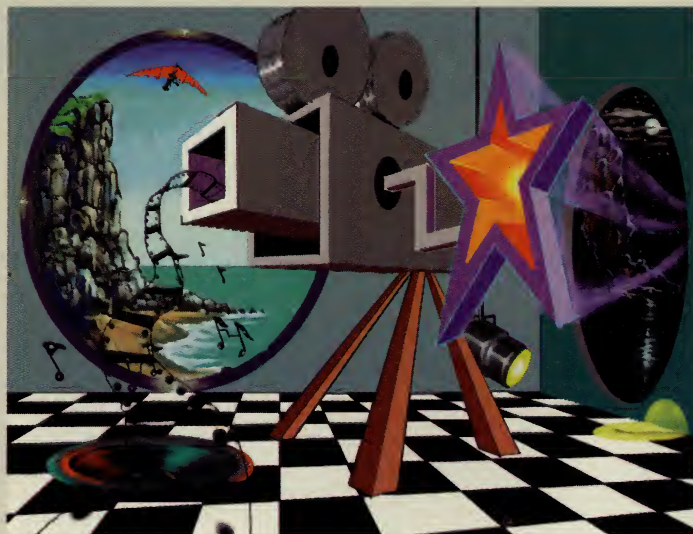
Los Angeles — The American Film Institute's Apple Computer Center for Film and Videomakers, better known as the Apple Lab, recently celebrated its second anniversary. In honor of the occasion, they offered a symposium on career retooling.

And, one of the Apple Lab programs last year was a summer internship on career development for disadvantaged youth in the Los Angeles area. Introduced to computers, video and multimedia equipment, eight Hollywood High School students, in addition to enjoying the class, found some exciting career possibilities.

The pilot program in New Media took place during July and August of 1992. After the Los Angeles riots, the institute said it felt that extra help for the city's youth was necessary.

Hollywood High faculty selected an ethnically diverse group of students, most of whom had no prior experience with computers.

Harry Mott, education director of the Apple Lab, was the program's primary instructor. He and his staff trained the students in video and computer basics.



AFI-Apple Lab Director Nick DeMartino brought in institute graduates to teach filmmaking, animation and computer graphics.

Final exams required the students to take the tools they had mastered and design an image.

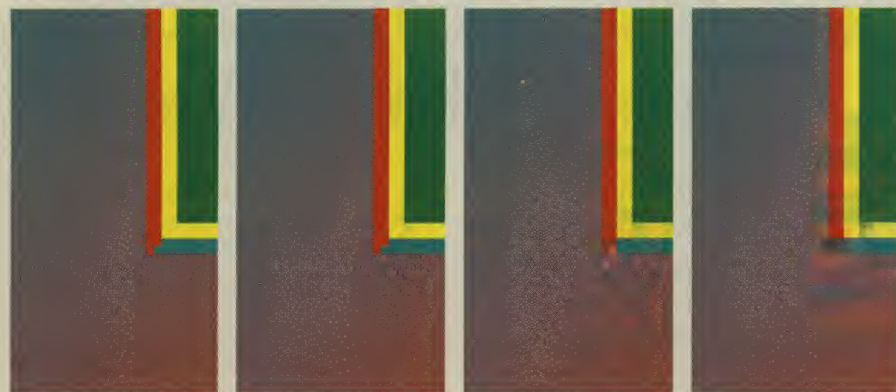
Suren Galadjian, 18, and Geraldo Garcia, 17, created this image of Hollywood using Adobe Photoshop. Galadjian said the process took three hours, with one drawing on screen as the other threw out ideas. The pair are still working together; they recently designed the cover of the Hollywood High School yearbook.

Galadjian took part in the program because "I thought it sounded like fun, and it would be good background for the future." At present, Galadjian is interested in studying car design and becoming a commercial artist or an architect. Garcia is also interested in commercial art and is considering working with computers sometime down the line. It is not certain if the internship program will be repeated this summer, but if it is, according to Mott, he'll be teaching and his former students will be assisting.

— By Maria Sample

The extreme misuse of JPEG torture test

JPEG was not designed to work with an image such as this, which contains large, smooth gradations of color with highly contrasting, hard edges at small pixel-per-feature counts. These lines are 2 pixels wide. The results of using Storm's PicturePress 2.5 board to compress a CMYK Photoshop file at different settings are shown below.



The highest-quality setting using the slider control in PicturePress is "100." Compression reached 1:3 without visible degradation.

The highest menu setting in PicturePress is "excellent," which produced slight artifacts around the corners. Compression reached 1:4.

The "high" setting exhibits obvious artifacts. Compression reached 1:6.

The "good" setting exhibits gross deterioration.

products process images in anywhere from three to 20 seconds.

Beyond JPEG. Storm Technology of Mountain View, Calif., has developed a modification of JPEG called JPEG++, which lets you select parts of an image (text or an image foreground, for example) and then apply a lower compression ratio to those selections.

Apple includes a JPEG-compatible image compressor, called the Photo Compressor, within QuickTime. Through its Image Compression Manager and Component Manager, QuickTime also supports third-party JPEG and other compression products.

The Photo Compressor supports compression ratios from 5-to-1 to 100-to-1. However, best results are achieved at ratios between 10-to-1 and 25-to-1, according to Kirke Shorte, senior product marketing manager for QuickTime technologies at Apple. It takes about 10 seconds to decompress a 24-bit, 640-by-480-pixel image on a Mac IIcx, he said, whereas the same operation on a IIx takes about four seconds.

Kodak of Rochester, N.Y., is working hard to promote its Photo CD format as a compression standard, albeit a proprietary one. While developers have added Photo CD support within applications (including Apple in QuickTime and Adobe in Photoshop 2.5), that support allows only reading of Photo CD files. In March, Kodak announced that developers will be able to write Photo CD files out to CD-ROM using the company's Portfolio authoring

software (see MacWEEK, March 29). The compression of images saved in Photo CD Portfolio format is based on Kodak's proprietary compression scheme which, like JPEG, eliminates redundant chrominance information.

Video compression. JPEG is also among the standards used for video compression today. It can be used to compress video frames individually through a process called intraframe coding. This allows users to randomly access any individual frame within the compressed video, making it ideal for digital applications in which access to every frame is necessary, such as video preproduction. The downside of intraframe coding is that even under high compression ratios, a few seconds of 24-bit-color video stored as motion JPEG takes up a lot of space.

The standards organizations that sponsor JPEG — the Consultative Committee International Telegraph and Telephone, and the International Standards Organization — have defined a compression standard called MPEG (Motion Picture Experts Group) specifically to handle motion video. In addition to intraframe coding for removing redundancies within individual frames, MPEG also employs interframe coding, which eliminates redundant information among frames. If the background of a video clip stays the same from frame to frame, for instance, MPEG will save the background once and store only the differences between those frames. No Mac products currently support MPEG, but it's likely that MPEG products will be available

for the Mac as soon as the standard is published.

MPEG supports compression rates of up to 50-to-1, assuming the MPEG 1 standard resolution of about 320 by 240 pixels for full-motion video. (MPEG 2 was proposed last year for handling higher-resolution, broadcast-quality images.)

"For digital videographers, there's really no choice but to compress because of the high storage requirements," said Brian Apgar, vice president of technology for SuperMac. But with technologies such as MPEG, the trade-offs in quality may be negligible. "In MPEG, you're throwing some of the frame away. That's going to make the motion of the objects less precise than they really are. But as long as the overall shape is approximately correct and the color is correct, your eye is happy."

In addition to its interframe coding capabilities, MPEG differs from JPEG in its asymmetrical approach to compression, using more hardware and computer power to compress full-motion video and audio than to decompress it.

The same holds true for the two video compression schemes currently supported in Apple's QuickTime 1.6: the Video Compressor and the Compact Video Compressor. Video Compressor was designed by Apple, Compact Video Compressor was designed by SuperMac and is licensed by Apple.

The Video Compressor offers both spatial (intraframe) and temporal (interframe) compression. Using only spatial compression, the Video Compressor offers compression ratios between 5-to-1 to 8-to-1. Using both spatial and temporal

compression, ratios supported go up to 25-to-1. With QuickTime, compressing a 24-bit-color, 640-by-480-pixel image on a Mac IIx would take one second, while decompression would take 0.20 seconds.

Compact Video Compressor supports compression ratios of about 25-to-1. Depending on the video and the Macintosh used, the software-only Compact Video Compressor "can take anywhere from 30 seconds to two minutes to compress a frame but can decompress a frame in a fraction of a second," Apple's Shorte said.

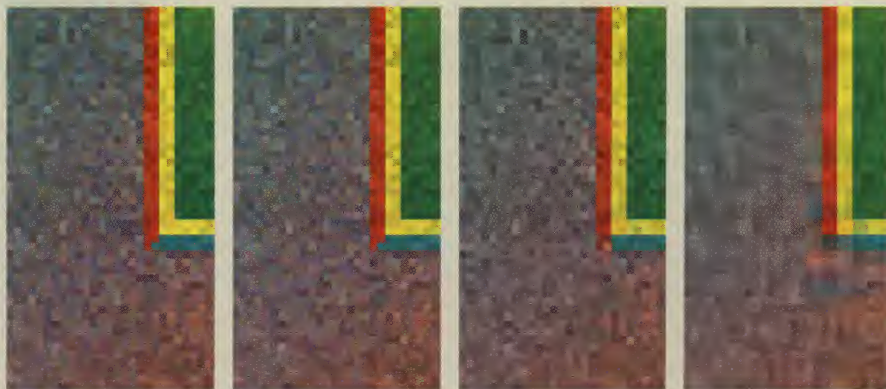
Apple last year announced that it will also support Santa Clara-based Intel's Indeo compression technology in future versions of QuickTime for the Mac and Windows, but no ship dates have been announced. New Video Corp. of Santa Monica, Calif., will supply the Indeo compressor for Intel to Apple. With the software-based video compressor, QuickTime users will be able to compress and decompress Indeo files on the Mac. According to New Video, the same files will run under QuickTime for Windows without any special hardware.

Animations. For computer-generated animations, Apple's QuickTime includes an Animation Compressor. An extension of the PICT file format, the Animation Compressor can work in either lossy or lossless mode and can play back images at up to 30 frames per second at 640 by 480 pixels, depending on the complexity of the images. □

Steve Rosenthal contributed to this report.

Addition of noise strongly masks artifacts

These examples show how noise (Photoshop Add Noise, gaussian distribution, setting 16) results in the disappearance of JPEG artifacts when compared with the series shown above. Noise is a feature of all photographic, video and scanned images, and its presence permits use of higher compression ratios with images.

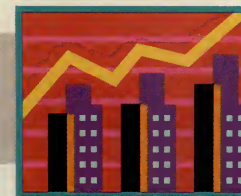


This file is virtually identical to the original after compression using the "100" setting.

Artifacts are not yet visible after using the "excellent" setting, and changes from the original take pixel-by-pixel examination to find.

The "high" setting exhibits faintly visible artifacts.

The "good" setting is once again not so, but results are better than those achieved compressing the image that contained no noise.



Apple unveils volume-licensing deal

Applies to System 7.1, other Apple software

By Jon Swartz

Campbell, Calif. — Apple USA last week officially unveiled a program that lets corporate users purchase software licenses, support and maintenance in volume for System 7.1 and other selected Apple products.

The Apple Software Volume Licensing Program, which is now available through 1,800 Apple-authorized dealers and eight reseller chains, applies to System 7.1, Macintosh PC Exchange, At Ease, Apple Font Pack, AppleTalk Remote Access Client, Data Access Language Client, TCP/IP Connection for Macintosh, MacX, SNA•ps 3270 and SNA•ps 3270 GC (see MacWEEK, April 19).

Education and government users can buy volume licenses from Apple directly.

Software program

- Available through 1,800 authorized Apple dealers and eight reseller chains
- Based on volume pricing
- One year of free maintenance for purchases of 500 or more software licenses
- Covers nine products

Source: Apple USA.

The previously unannounced 4-month-old pilot program, which Apple had offered through only eight reseller chains, is based on volume pricing. It comes with toll-free technical support, including pre-sales assistance, installation and troubleshooting.

Apple said that as part of the introduction of the program, it is extending a discount on System 7.1 volume purchases from July 15 to

Dec. 31. Sites with 500 or more users may buy a bulk license for \$10,000, according to Lisa Jones, software channel development product manager for Apple USA.

Jones said pricing for TCP/IP Connection for Macintosh has also been lowered in response to user complaints. A TCP/IP license for 250 to 1,999 users is now \$3,000; a license for 2,000 to 4,499 users costs \$4,500; and a license for 5,000 or more users is \$7,500.

Apple is providing one year of free support for purchases of 500 or more software licenses for all nine products, Jones said.

Apple is also offering Apple Software Maintenance Program (ASMP), an annual subscription program that provides users with upgrades, bug fixes and enhancements.

ASMP is available for all products offered under the Software Volume Licensing Program except the Apple Font Pack. □

Kaleida to join with Motorola, Scientific Atlanta on TV services

By Lisa Picarille

Mountain View, Calif. — Kaleida Labs Inc. is joining Motorola Inc. and Scientific Atlanta Inc. to develop hardware and software for interactive multimedia services via cable-television networks.

The companies plan to offer new forms of consumer-oriented cable TV services, including single and multi-user interactive entertainment such as shopping, information and education programs.

Under terms of the agreement, which is expected to be finalized next month, Kaleida, based here, will supply its ScriptX multimedia technology as the basis for content developers to create interactive services. The actual television set-top box, due next summer, will be manufactured by Scientific Atlanta, based in Norcross, Ga. For its part, Schaumburg, Ill.-based Motorola

will provide processor technology based on the PowerPC architecture.

The new alliance is expected to challenge a similar effort announced this spring in which Microsoft Corp., Intel Corp. and General Instrument Corp. announced they would deliver TV devices in 1994.

Industry watchers said set-top consumer boxes may range from \$150 to \$300, depending on the computing capabilities offered.

Kaleida, an Apple-IBM joint venture, has already garnered support from a variety of hardware manufacturers, including Hitachi Ltd., Toshiba Corp., Mitsubishi Electric Corp. and Creative Technology Ltd.

Each of those companies has announced multimedia player devices that will support ScriptX, which is slated to be unveiled at this month's Digital World show in Beverly Hills, Calif. □

Xpand CD-ROM puts trade show on users' desktops

Former Apple execs take start-up helm

By Lisa Picarille

San Jose, Calif. — A start-up led by former Apple executives has developed software technology that brings the information blitz of a major trade show to users' desktops, but without the hustle and bustle.

Xpand is preparing a fall launch of Xpand Xpo, a "virtual trade show" on CD-ROM that lets users navigate through a digital expo without attending the event.

Designed to raise international awareness of U.S. products, the promotional CD will initially be distributed to 20,000 people in 33 countries, including dealers, distributors, Apple sales staff, developers, user groups and large corporate customers.

Xpand's target figure of 80,000 "attendees" is 20,000 people smaller than the attendance of this year's Macworld Expo in Tokyo, the Mac industry's biggest show.

Xpand officials said this goal is realistic because Apple estimates that the installed base of its CD-ROM drives will top 1.5 million by late

1993. Xpand is also working on deals to bundle Xpand Xpo with CD-ROM-equipped Macs and external CD-ROM drives.

The computer industry has spawned hundreds of trade shows and conferences. These can cost vendors more than \$140,000 just to rent and operate a large booth — not to mention travel and hotel expenses. The cost of exhibiting on the CD-ROM ranges from \$3,000 to \$16,000.

Xpand Xpo's annual subscription fee is \$35; the disk is updated twice a year.

Companies participate in Xpand Xpo by purchasing disk space rather than renting floor space at an actual show. Participants are permitted to use co-op funds, which are typically allotted for advertising and marketing promotions with distributors and retailers.

Like conventional trade shows, exhibitors can rent space in a variety of sizes and configurations. Xpand's electronic "booths" are sold in 5-Mbyte chunks. About 1 Mbyte can include Mac software demos; remaining disc space can contain product literature and QuickTime movies that describe product features. Xpand provides translation

and localization of literature, product movies and advertising.

Users navigate Xpo's virtual show floor by clicking on directional buttons. They can view a map of the show floor, call up a list of exhibitors, select a particular booth and obtain information on how to purchase products through dealers.

Xpand can be reached at (408) 244-0995. □

SuperMac, Sega team

Sunnyvale, Calif. — SuperMac Technology Inc. is bringing its video-compression technology to a video-game screen near you.

The company, based here, last week announced an agreement in which Sega of America Inc. will use a customized version of SuperMac's Cinepak technology to bring high-fidelity, full-motion video to Sega CD-ROM video games such as Jurassic Park and Joe Montana NFL Football.

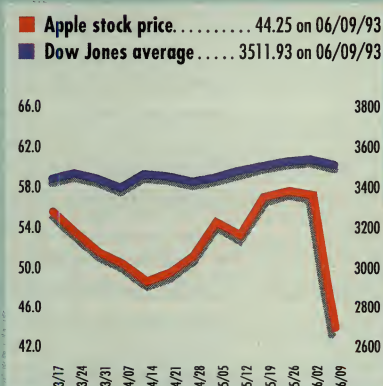
Last month SuperMac inked separate deals with Atari Computer Corp., Microsoft Corp. and Cirrus Logic Inc. to license Cinepak technology. □

StockWatch

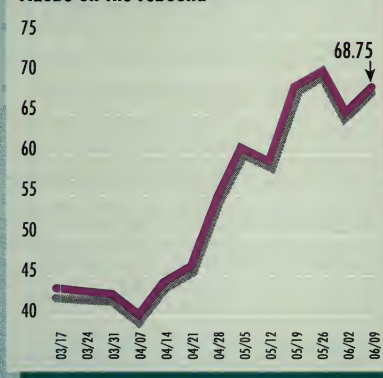
	06.09.93 CLOSE	WEEKLY % CHANGE
Apple	44.25	-22.37
SOFTWARE DEVELOPERS		
Adobe	68.75	4.36
Aldus	15.75	-3.08
Caere	7.88	0.00
CE Software	3.50	-12.50
Microsoft	91.00	-4.96
Novell	27.75	-3.90
Symantec	15.50	-11.43
PERIPHERALS VENDORS		
CMS	3.13	4.17
HP	86.25	0.44
QMS	9.13	-6.41
Radius	3.25	-3.70
RasterOps	8.88	-4.05
Sigma	4.00	0.00
SuperMac	22.50	-7.22
STORAGE		
Conner	10.50	-10.64
Maxtor	6.75	-5.26
Quantum	11.88	-3.06
Seagate	15.38	-6.11
SyQuest	13.50	-8.47
INDUSTRY INDICATORS		
DEC	43.13	-2.27
IBM	52.88	-1.86
Motorola	82.00	-2.81
Sun	30.50	-2.40
Dow Jones	3511.93	-1.17

Compiled by Nordby International Inc.

While Apple's stock tumbled 22.4 percent to \$44.25 per share last week following estimates of lower-than-expected earnings for its second half of fiscal 1993 (see story, Page 1), Adobe Systems Inc.'s



Adobe on the rebound



stock jumped 4.4 percent to \$68.75 per share.

The Mountain View, Calif., developer is steadily rebounding from March when its stock price dipped into the \$40 range.

"Why's Apple talking to me about UNIX?"



Introducing MacX for Macintosh.

Because you probably didn't realize you can now run X Window System™ applications on a Macintosh®.

It's simple and it's inexpensive. And all you have to do is add MacX.™

MacX is a seamless extension of the Macintosh operating system that takes only a few seconds to install. It allows Macintosh computers to run X Window System applications concurrently in separate windows on the Macintosh desktop.

Actually, MacX is even better than that. It allows you to run Macintosh and X applications at the same time. And cut and paste informa-

tion between the two as easily as cutting and pasting between two Macintosh applications. Which means now everyone on your system can use the same X applications. Without anyone uttering a single word of confusion.

In fact, since MacX supports all X application tools, as well as OPEN LOOK and Motif GUIs, MacX helps you answer the question, "How do these Macintosh computers fit into my open systems environment?"

Very well, thank you.

Call 1-800-554-5999, extension 230, now and we'll send you a free copy of our Technical Overview of MacX.* The power to bring Macintosh computers into your UNIX® environment.

The power to be your best.® Apple 

Dealer's Corner by Scott Harris

Economics 101: Supply, demand revisited

The computer industry today plays by economic rules unlike any we learned in school. Forget supply and demand. Prices are cut on an unavailable product — sometimes before the first unit ships.

This trend is apparent in the MS-DOS world, where pricing is more a matter of competitive perceptions than of supply and demand. If Dell Computer Corp. announces a lower-cost personal computer, Compaq Computer Corp. responds by lowering prices on a comparable model, even if demand for that model far outstrips supply.

The larger companies can also affect industrywide pricing without shipping, or even producing, a product. Maybe that's the strategy: Announce lower-priced, lower-margin products with no intention of shipping them in quantity, let your competitors kill each other trying to compete with your non-existent products, then clean up when the blood bath is over.

Apple, likewise, seems to be pricing products based largely on what it sees as competitive price points and — if chronic shortages are any indication — indifferently to supply-and-demand projections.

Perhaps the shortages themselves are designed to create profit by routing buyers to available models with higher markups or by deferring large-scale production

of aggressively priced models until anticipated cost reductions catch up with their newly announced pricing.

Less than zero. It's hard to believe that all the shortages are honest miscalculations. A recent memo from Apple distributor Intelligent Electronics informed dealers that a shortage of 230-Mbyte Centris models was "due to the demand being greater than estimated." The sheet also indicated that IE has thousands of back orders, with none scheduled to ship from Apple.



If even a couple hundred units were ready to ship from Apple, I could believe claims of unanticipated demand. But zero? Is Apple telling us that it was caught short because it didn't expect to sell so much as one 230-Mbyte machine this month?

This problem is not unique to Apple. Compaq gave us the same story last year about some Pro-Linea 486 models. Although there was unexpectedly heavy demand, apparently none shipped. Who would have thought that sales of even one unit could constitute unforeseen demand?

Pricing and shortages can also be used to create a self-fulfilling prophecy. When announcing models, Apple has often said older models would continue to be available

as long as there was sufficient demand. Translation: As long as it has units in its warehouses.

Demand is easily manipulated by pricing and availability. If Apple wants a model to exhibit low demand, it can make this happen by lowering the price of another model and/or tightening supply.

Brother, can you spare an LC III? The LC III has been one of the most popular Macs since its introduction. But now Apple is offering the Performa 450 — virtually the same machine — through other channels, at a price that undercuts the comparable, regular-line model. Meanwhile, there is a shortage of LC IIIs.

From this situation I can envision Apple announcing that, because of lagging sales, the LC III will be withdrawn from the dealer channel. (It currently anticipates LC III shortages for at least three more months.)

Of course, Performa 450 sales will outstrip LC III sales, thereby giving credence to Apple's claim that the mass-merchant channel is where consumers want to buy their first Macs. The company is not exactly giving them a choice.

It's a different approach to supply and demand: Put the supply where you want the demand to be. □

Scott Harris specializes in sales, support and training at The Computer Edge in Mount Kisco, N.Y.

Business
B R I E F S

Ex-DEC exec to direct Asanté

San Jose, Calif. — In a move industry observers call a precursor to a public offering, Asanté Technologies Inc. last week named former Digital Equipment Corp. executive Ralph Dormitzer as president and CEO.

Dormitzer, who oversaw DEC's \$550 million Interconnect Products Group for four years, will steer Asanté's aggressive push to hit \$100 million in annual sales. The 150-person networking company, based here, posted \$47.5 million in sales for its fiscal year 1992.

Dormitzer, 55, succeeds company co-founder Wilson Wong, who is now co-chairman and general manager of Asanté's Apple and Desktop Communications Business.

Frame cuts work force 20 percent, names new CEO

San Jose, Calif. — Stung by a sharp decline in sales, Frame Technology Corp. laid off 20 percent of its work force this month, appointed a new CEO and warned it will lose money for the second consecutive quarter.

Frame, based here, dismissed about 90 of about 450 employees and said it would take a \$13 million charge against earnings for restructuring expenses. The company also named L. George Klaus president and CEO. He succeeds Paul Robichaux, who remains chairman.

Robichaux said the cutbacks were necessary to balance sagging sales. In April, Frame reported a \$3.9 million quarterly loss. The company said sales were \$16 million, compared with \$24 million in the same quarter a year earlier.

Merisel expands U.S. sales division

El Segundo, Calif. — Merisel Inc. has expanded its U.S. sales organization in an ongoing campaign to reach more resellers.

The distributor, based here, last week announced a new sales operation aligned into three channel segments: dealer, value-added reseller and consumer. In addition, Merisel added its ninth sales group, the Systems Integrator Division.

Court overturns AMD-Intel arbitration agreement

Santa Clara, Calif. — A state appeals court has overturned an arbitrator's ruling that gave Sunnyvale, Calif.-based Advanced Micro Devices Inc. technology rights to Intel Corp.'s 386 microprocessor.

Intel, based here, said this month's decision by California's 6th District Court of Appeals eliminated any Intel 386 technology rights AMD could claim stemming from the companies' 1982 technology-sharing agreement.

"The arbitration [agreement] is over; this is the final chapter," said Tom Dunlap, Intel vice president and general counsel.

AMD said it would ask the appeals court to reconsider the ruling.

MacWEEK index
MAY TOP SELLERS

The top 10 products by dollar volume and category at ComputerWare, a chain of Mac-only resellers in California. The list does not include Apple-label products.

APR. MAY Hardware

1	1	Hewlett-Packard LaserJet 4M printer
2	2	Hewlett-Packard DeskWriter printer w/AppleTalk
10	3	Hewlett-Packard ScanJet IIc
5	4	PLI Infinity 88-Mbyte removable drive
*	5	SuperMac Thunder/24 graphics card
*	6	PLI Infinity 128-Mbyte optical drive
*	7	SuperMac SuperMatch 20-inch monitor
6	8	Radius Two-Page Display 19-inch monitor
*	9	Quantum 240-Mbyte ProDrive
4	10	Hewlett-Packard DeskWriter 550C printer

APR. MAY General applications

1	1	Microsoft Office 3.0
2	2	QuarkXPress 3.1
6	3	Microsoft Excel 4.0
3	4	Microsoft Word 5.1
4	5	Claris FileMaker Pro 2.0
5	6	ClarisWorks
8	7	Aldus PageMaker 4.2
*	8	CA CricketGraph III
7	9	Abacus StatView 4.0
*	10	Microsoft Project 3.0

APR. MAY Graphics and multimedia

1	1	Adobe Photoshop 2.5
2	2	Adobe Illustrator 3.2.3
*	3	Macromedia Director 3.1
5	4	Claris MacDraw Pro 1.5
3	5	Fractal Design Painter 2.0
10	6	HSC Kai's Power Tools
*	7	Synergy KaleidaGraph 3.0
7	8	Aldus FreeHand 3.11
*	9	GraphSoft MiniCad Plus 4.0
8	10	Adobe SuperATM

APR. MAY Connectivity

1	1	Global Village PowerPort/Gold 14000
2	2	Global Village TelePort/Gold 14000
*	3	Cayman GatorBox CS
*	4	DCA MacIRMA for NuBus
6	5	Asanté MacCon+LCIII Ethernet card
8	6	Asanté MacCon+IIIE64 Ethernet card
*	7	Supra FaxModem V.32 MacPac
*	8	Asanté FriendlyNet TOT adapter
5	9	Asanté MacCon+IIIE64 Ethernet card
3	10	Global Village PowerPort/Silver 9600

APR. MAY Utilities

1	1	Symantec AntiVirus for Mac 3.5
*	2	La Cie SilverLining 5.4
2	3	Symantec Norton Utilities for Mac 2.0
*	4	FWB CD-ROM Toolkit
3	5	Berkeley Systems After Dark/M.A.D.bundle
*	6	Berkeley Systems Star Trek screen saver
10	7	Fifth Generation Suitcase 2.1
5	8	Now Utilities 4.0
7	9	Berkeley Systems After Dark 2.0
4	10	CE Software QuickKeys 2.1.3

*Didn't make top 10 last month.



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GLOBAL MARKETPLACE

Potential rewards for companies conducting business overseas are tempered by cultural and legal pitfalls as well as complications in the distribution of and support for hardware and software. In this Special Report, MacWEEK examines these issues and offers guidelines for finding success in the world market.

Firms expanding abroad face culture, sticker shock

By Gigi Bisson

No service, no support and no warranties are some of the obstacles faced by U.S. companies setting up shop overseas.

In Nepal, they turn off the electricity every evening from 5 p.m. to 7 p.m. In Warsaw, Poland, you can take your pick of technical service shops — one called Guru, another called Rodent Service. A 64-Kbyte Atari 800XL, IBM PCjr or Timex-Sinclair can't be given away in the United States, but these hardware dinosaurs fetch hundreds of dollars in some international black markets. Throughout most of the world, batteries are scarce, phone jacks and electrical current are incompatible, and if you run out of toner cartridges or floppy disks ... *quelle domage*.

Companies setting up shop outside the most developed parts of Europe may find themselves technically sophisticated strangers in a technically backward land, faced with nonexistent support, steep prices and U.S. product warranties that don't hold water overseas.

Tasks such as shipping a product to a subsidiary, finding localized products that fit the language and cultural demands of a region, and customer support in far-flung lands add up to a Pandora's box of challenges for both information-service directors and the software and hardware companies that try to satisfy their demands (see story, right).

Polished Apple. The good news for Mac users is that Apple is a glowing exception to this norm. In

April, Apple became the only major computer company to offer a global warranty for its entire desktop and portable product lines, providing customer service at Apple Authorized Service Providers worldwide. In addition, it announced Apple Assurance, a plan to help customers set up and use Apple hardware, software and networking products via a toll-free number.

"All of our providers must honor the policy, though not all can offer on-site service," said an Apple representative. The customer must carry receipts to prove purchase and pay shipping and handling charges if necessary.

No place like home. Most software and hardware manufacturers MacWEEK interviewed, however, cannot honor a warranty once the product is outside the country of purchase. These companies recommend that you buy locally to assure support from the distributor. However, if a company waits until it is abroad to stock up, it may find that the product sells for as much as six times its U.S. price — if they can find it.

"The object is to buy locally," said Gerard Neiditsch, vice president of the MacIS (Managing Apple Computers in Information Systems) Pacific region and director of information systems for Blake, Dawson & Waldron, an international law

See Customers, Page 41



PHOTOS FROM SUPER STOCK, BLACK STAR AND WEST STOCK

New strategies for software sales are spurring international growth

By Lisa Picarille

Despite barriers, software companies are pursuing lucrative global distribution channels.

With international sales accounting for nearly half their revenues, most major U.S. software companies are fine-tuning their global distribution strategies.

Software standardization in multinational corporations, the rapid growth of the international computer market and a changing political climate abroad have made the prospect of doing business overseas very attractive for software publishers seeking new profit centers.

Unabated sales explosion. The European software market, which includes Germany and other Eastern European countries, was an estimated \$15.2 billion in 1990. That figure is expected to more than double to \$41.7 billion by

1995, surpassing the 1995 projections of \$34.2 billion for the U.S. software market, according to International Data Corp., a market research company in Framingham, Mass. (see chart, right).

Asia, especially Japan, has also proved to be a lucrative market. In 1992, revenues for Japanese versions of software created by 20 large U.S. companies (including Microsoft Corp., Lotus Development Corp. and Borland International Inc.) reached \$179 million, a 12 percent increase over 1991, according to the Software Publishers Association, a trade organization based in Washington, D.C.

The first foreign language versions of most operating system products come out in Japan. Apple is keenly aware of that — the Mac



has an 8 percent share of the Japanese market, the largest share of any computer maker.

Making it offshore. If companies can overcome the hurdles posed by a different country, global distribution can be a key competitive weapon, according to Scott Lewis, director of worldwide distribution for Claris Corp.

The Santa Clara, Calif.-based company has had an international presence for eight years and derived about 40 percent of its fiscal 1992 sales, \$105 million, outside the United States.

To service its European subsidiaries, Claris operates a manufacturing plant in Dublin, Ireland. Other major software developers, including Lotus, Microsoft, Borland and Symantec Corp., have also been drawn to Ireland because of the attractive tax incentives the country offers high-tech companies. These include cash grants as well as a 10 percent tax break to companies that hire Irish workers, many of whom are multilingual. In addition, living expenses in Ireland are less than half that of most European countries.

Lewis said having one central European manufacturing facility to serve all of Claris' international markets, along with sales offices in most major cities, is a key element to its overseas success.

Microsoft, which derived 55

percent of its \$3.2 billion revenues for fiscal 1992 from international sales, has a huge presence abroad, with sales offices in several countries. Although Microsoft's European business operations are headquartered in Paris, the company's European manufacturing facility is in Dublin.

Small ones get their share.

Smaller developers agreed that having an international presence is important but said they often must look for alternatives to the cost-intensive prospect of setting up sales offices or a manufacturing facility.

For Contact Software International, a \$15.1-million Carrollton, Texas-based software developer, the move to international sales was made easier when it was acquired by Cupertino, Calif.-based Symantec for \$41 million (see MacWEEK, May 10).

Contact Software officials expect Symantec's marketing muscle, along with its solid position in the distribution channel, to more than double international sales of Act!, the company's contact-management software. Symantec's European sales force totals 200, while Contact has just eight European sales representatives.

"The potential increase in overseas sales was a key factor in our decision to join Symantec," said Mike

See Vendors, next page

Global software expansion is hampered by strict U.S. laws

By Gigi Bisson

U.S. trade restrictions, such as those on encryption technology, delay and discourage a company's expansion into new countries.

For U.S. businesses increasingly expanding overseas, the paperwork can be daunting — and for unexpected reasons.

When U.S. businesses ship hardware and software abroad to install computer systems in their overseas subsidiaries, it's all too easy to inadvertently break the law — or knowingly skirt around it. As U.S. businesses expand overseas in record numbers, the overall trend is toward internationalization and globalization of software and hardware standards. Many computer companies are now calling for global legal standards as well.

A big step in that direction was accomplished with the formation of the European Community, the pending trade alliance of 12 European nations. Previously, a company doing business in Europe faced a dozen sets of national requirements and certification procedures.

It has been estimated the EC will eliminate the need for some 50 million to 60 million customs documents a year. But while Europe is eliminating trade barriers, the United States still clings to trade restrictions that date back to the Cold War.

When a product contains encryption technology, the developer must negotiate with the National Security Agency to arrive at a version that is exportable. The law makes client-server applications more expensive and time-consuming to build because of the many months it takes to negotiate with the NSA. Consequently, this limits the ability of U.S. software companies to compete in the emerging global market.

Cryptic laws. Encryption is the key to delay. "As far as the government is concerned, [encryption] is the same thing as bringing a nuclear bomb in a suitcase," said Thomas Chan, an attorney with Chan and Jodziewicz of Los Angeles. On the other hand, if you're in Moscow or Hong Kong, you could duplicate hundreds of copies of software and legally sell them on the street.

And while it is still "anything goes" on Asian streets, U.S. companies are nevertheless hampered by U.S. trade-security policies. "The restrictions cause problems when you need something fast and can't buy it," said computer consultant David Del Torto of Level Seven Design in San Francisco, who

remembers the difficulties he encountered setting up a Mac system for a client in Hungary.

Del Torto was upgrading Disk Doubler by Salient Software Inc., a self-expanding archive that uses Data Encryption Standard (DES). Salient could not mail the disk directly to Hungary, so Del Torto routed the disk through a San Francisco post-office box, but it took 10 days to process the order.

Many users simply violate the law unwittingly by sending software via electronic mail. "I can send encrypted software over a modem. How do you stop me? Let's be realistic," Chan and Jodziewicz's Chan said.

The manufacturer is also required to give the name and address of every customer to the U.S. State Department. "Not all users send in their registration cards, and it's impossible to know the names of every person using a system," Chan said.

If the software is boxed, it should clearly be marked "Not for Export" or "Subject to Export License." However, users often carry software on a hard drive or unmarked floppy disks, and they unwittingly may be breaking the law. The penalties include heavy fines and jail terms.

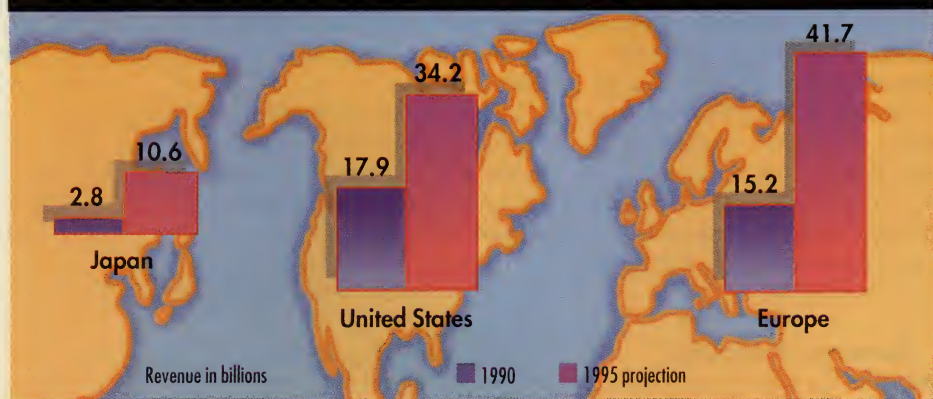
The regulations cause delays for businesses. "Even if you know the rules, it takes a few weeks," Chan said. "It's tough for a lawyer to keep up, let alone the customer. You have to find the right lawyer, or call the Office of Defense Trade — and they change their phone number constantly to avoid the deluge of calls."

According to Andy Blau, a policy analyst at Electronic Frontiers Foundation (EFF) of Washington, D.C., Cold War restrictions are still in effect for fiber-optic, communications, encryption and cellular technologies. Licenses are also required to export any computer of more than 50 MHz. Computers of more than 100 MHz must be escorted abroad by an armed guard.

Victims of security. The irony of the U.S. government's encryption policy is that it sacrifices corporate security for national security. The thought of using a network with weak or nonexistent security is particularly alarming while doing

See Legal standards, Page 42

Worldwide revenues for shrink-wrapped software



Source: International Data Corp.

Vendors

From previous page

Muhney, Contact vice president of marketing, who will join Symantec as vice president of the newly formed contact-management group.

"It makes sense to develop internationally, but it's incredibly expensive," said Royal Farros, chairman of Mountain View, Calif.-based T/Maker Co., a \$6 million privately held company that derives about 5 percent of its annual revenues from international sales. "You have to invest a lot in a country before it is profitable. For a small company, the investment is many times that of setting up a U.S. investment."

T/Maker recently sold WriteNow, its Mac word processor, to WordStar International Inc. of Novato, Calif. WordStar's flagship DOS and Windows word processors have strong international sales, and T/Maker expects WordStar's enviable distribution channel to boost sales of WriteNow.

Republish or perish.

T/Maker's current approach to international distribution is on a much smaller scale than WordStar's; T/Maker works with republishers.

Typically, a republisher purchases the foreign rights to a product, creates a localized version and puts its name on the product. The republisher, who pays a royalty to the original developer, is responsible for all documentation, support and upgrades.

"The advantage of a local republisher is that you can get into a lot of countries quickly with little overhead," said Jeff Tarter, publisher of Soft•letter, an industry newsletter based in Watertown, Mass.

The use of republishers, however, is declining. Republishers are attempting to keep their margins high by charging expensive fees for localization because of the increasing complexity of software applications.

"With republishers, international customers were paying two to three times the cost of the U.S. version of the package," Tarter said. "And the natives got restless about the price."

Bob Orbach, president of Orbach

Inc., a New York-based consulting company, said: "It's always a price advantage for U.S. publishers to sell direct in Europe because they can command a higher price. Therefore, the profit margin is higher."

Microsoft is considered by industry watchers to be a leader in setting consistent global pricing for its applications, according to Tarter.

"Users in France are not going to be happy if they paid \$300 more for a product than their Germany counterparts," said Mike Negrin, director of U.S. channel marketing for Redmond, Wash.-based Microsoft. "So we try to have almost the same prices across the board, with slight increases depending on the current values of currency."

Another key factor in creating localized versions of applications is timing. "Concurrent delivery of international and U.S. versions is a must," Tarter said.

Microsoft and other developers have also begun writing code in ways that simplify the creation of foreign-language versions. But even Microsoft will contract with republishers for localized versions in countries where the installed base and demand is minimal.

WorldScript. Developers have another option for creating multilingual versions of their software — Apple's WorldScript. Apple recently began shipping its Japanese Language Kit, the first module to offer support for System 7.1's WorldScript technology.

WorldScript is a set of application programming interfaces that, when supported, allows text input in various languages via Apple-supplied language modules.

For users, WorldScript promises to enable document creation in multiple languages without requiring that a specific foreign-language operating system be installed. Another key advantage is the assurance that the most current version of Mac system software is available almost simultaneously in a variety of countries.

To take advantage of World-



Xpand's XPO, a trade show on a CD-ROM, lets vendors display products for a fraction of the cost of a trade show booth. Buttons let users get information, demonstrate software and navigate to various "booths."

Script, developers must rewrite applications. This process, a relatively big undertaking, is less time-consuming than the previous method of having to modify the application for individual languages.

To date, few companies are shipping applications that exploit WorldScript. Nisus Software Inc. of Solana Beach, Calif., and WordPerfect Corp. of Orem, Utah, are both shipping versions of their word processors that support Apple's Japanese Language module.

Expressing localization.

Unlike the U.S. market, where vendors establish relationships with three to five major distributors or sell direct, developers in Europe may have to deal with hundreds or even thousands of dealers and distributors in many countries.

"International distribution is a maze of tiny business relationships," Tarter said. "They all must be individually maintained. And any one of which — if screwed up badly — could mean you have no product in that country."

Iona Software Ltd., a Dublin-based start-up, is attempting to help small U.S. Mac developers cash in on the European market by offering a variety of republishing services. Iona, which now handles only Mac developers, will translate the products, put its name on them and deal with the complex European network of distributors on behalf of the developers. The original developer retains ownership rights.

Iona offers a suite of 10 products, including applications from After Hours Software and Inline Design. It acts as a liaison for smaller companies that may have otherwise been ignored by international distributors. This also means software developers need maintain only a single relationship to receive European distribution.

European distribution puzzle. The need for companies such as Iona is readily apparent to

most small Mac software developers, who said they would have liked to receive more global distribution help from Apple.

"Apple used to really help out small developers when it was still trying to evangelize its Mac line around the world," an unnamed developer said. "Apple now believes the Mac is entrenched and doesn't need to spend the money or make the investment."

Relief may be on the way. Apple's Developer Services Group is developing CD-ROM technology to distribute third-party applications (see MacWEEK, April 19).

Another alternative is San Jose, Calif.-based Xpand's Xpo, a "virtual trade show" on CD-ROM. Exhibitors purchase disc space on Xpo and provide product information and demo software. An annual subscription for Xpo is \$35, and the disc is updated twice a year.

The direct approach. As in the United States, direct sales in Europe are increasing. Although mass merchandisers and superstores haven't experienced the same rapid growth as in the United States, there is a move in that direction, said John Hartnett, distribution manager for Claris Ireland.

Microsoft's Negrin said Europe is missing the retail part of the software business, not because of timing but because of a lack of investment.

"Real estate is much more expensive in Europe," Negrin said. "The cost differential between there and the United States is huge. In Europe, they just don't have the physical real estate to build many superstores."

Despite differing opinions on the direction of global distribution, almost all agreed that the U.S. market continues to set the pace as well as trends in distribution.

"The U.S. trends today are adopted by the rest of the world in a couple of years, with the United Kingdom and Canada usually following more quickly," Claris' Lewis said. □

1992 international sales for Mac vendors

COMPANY	TOTAL REVENUES*	TOTAL EXPORT	INTERNATIONAL REVENUES*
ACI US Inc.	\$29.4	60%	\$17.7
Aldus Corp.	\$174.1	48%	\$83.6
Autodesk Inc.	\$367.7	57%	\$209.6
Lotus Development Corp.	\$900.1	50%	\$450.1
Microsoft Corp.	\$3,250.0	55%	\$1,787.5
Novell Inc.	\$933.3	47%	\$438.6
Symantec Corp.	\$217.8	33%	\$71.9
WordPerfect Corp.	\$550.0	44%	\$242.0

Source: The Soft•letter 100. *In millions.

Customers

From Page 38

firm whose 1,100 employees in London, New Guinea and Australia use Macs linked by ISDN (Integrated Services Digital Network) high-speed networks. "We look at options only when [buying locally] is prohibitively expensive," Neiditsch said. "We prefer to work directly with the manufacturer and try to negotiate an agreement."

Neiditsch recalled the challenge of setting up a legal office in Papua, New Guinea, a mineral-rich island that has been suddenly thrust into the 20th century. "The infrastructure is primitive. Like most of the Far East, electricity is not reliable, and there are few contacts with the outside world," he said.

"It's very difficult to support a site from a remote location. We draw on local resources, but computer literacy is far lower. In New Guinea, we had to grow our own people's skills and even train the dealers to provide our customer support."

Starting from scratch. Even in Western Europe, a U.S. company should brace for severe sticker shock and be self-sufficient with everything from monitors to mouse pads. "There is only one place in all of Paris where you can rent a computer — and it's a city of 6 million people," said Tony Rodriguez, international coordinator for Software Trading International of San Francisco, an organization that helps U.S. software companies with translation, localization and technical support in Europe.

"Staffing in a foreign country is not a pleasant task, either," Rodriguez said. In France, for example, it is almost impossible to fire somebody, the social-security program costs companies an additional 50 percent on top of salary, and employees receive a mandatory five-week vacation.

Rodriguez recommends hiring a technical-support staff in the United States and sending it abroad for at least six months before hiring locally. Recognizing the need for hiring assistance, he founded the International Computer Professionals Association to help international software professionals and employers link up.

Software and hardware prices, with few exceptions, are higher outside the United States because import tariffs, shortages, dealer markups and inflation more than double the cost of a product. In Brazil, for example, protectionist policies have created import tariffs on computers as high as 40 percent to 50 percent.

"Prices in Eastern Europe are astronomical," said international software consultant David Del Torto of Level Seven Design of San Francisco. "As a rule, you'll pay five

times the U.S. price." While working in Croatia, he said he saw a English-language copy of Aldus PageMaker selling for \$2,500 and Adobe Photoshop selling for \$2,200. In the United States, those products cost \$895 each.

Del Torto said that cost is not justified when the customer gets skimpy technical support. "When you call U.S. tech support and say you're calling from Budapest, Hungary, you immediately go to the bottom of the queue," he said, adding the lone exception was Apple. "An Apple customer-service guy called me long distance at what was 9 p.m. in California," he said. "It blew my mind."

Martin Doetling, worldwide product marketing manager at Frame Technology Corp. in San Jose, Calif., said, "It's the economy of scale." Software developers maintain that high prices are justified because of the expense of localization, the making and marketing of special foreign-language versions of a product.

Make it local. Localization involves more than translating the interface and manuals into a new language. Customer service, ad campaigns and sales strategies may be markedly different. Product-name copyrights must be verified, and even slogans must be changed to fit cultural idiosyncrasies.

Scandinavia and Holland have a higher tolerance for English software, but it must conform to the metric system, date and time formats, and paper sizing. Spelling checkers must be in British English.

Apple sells Macs with operating systems in 32 languages. But only a handful — Chinese, German, Japanese and French — offer large enough Mac markets to make translation cost-effective. A Hebrew version is simply not profitable enough to produce.

Russia is one exception where a huge single-language population makes the gamble of taking a small profit margin worthwhile for some companies. For example, Lotus 1-2-3, priced at \$495 in the United States, is listed at the equivalent of \$80 in Russia — a price that still represents three months' salary to the average Russian.

The high cost of software has fueled rampant piracy in many countries where duplication of software is legal (see story, next page).

"We prefer that customers buy in the local market," said Dave Wollet, head of European operations for QMS Inc. of Mobile, Ala. "If they buy in the United States and ship the printer overseas, we don't know it's there." Forty percent of the company's sales are in Europe.

Following Apple's success in Japan, QMS now has 9 percent of the Japanese printer market, right

behind NEC Corp. With a goal of increasing that to 55 percent, QMS has been building facilities in Holland, the United Kingdom, France, Germany, Switzerland, Sweden, Canada, Hong Kong, Japan, Australia and New Zealand.

"U.S. companies often make the mistake of trying to force everybody to do business out of the United States," Wollet said. "As a customer, I'd look for a company with on-site representation in the country. Otherwise, if the product goes down, you have to ship it back to the United States. I prefer the company that makes it easiest for me."

Maire Kushner, general manager of Radius Inc. Canada of Toronto, said: "The key to hardware is service. But you need to be a multibillion-dollar company to offer it." Half of Radius' sales are spread across 25 foreign countries. Although Radius relies on dealers for support, it also has offices in Japan; Paris; London; and Frankfurt, Germany.

Warranties end at the border. Lee Ray Massey, director of European support and international distribution for Hewlett-Packard Co.'s inkjet-printer division, also recommends buying locally. HP has a worldwide service organization for replacement and dealer repair, but the warranty is honored only in the country of purchase. "It's beginning to change with the EC (European Community), but customers are still reluctant to send a product across borders for repair," he said.

HP was one of the first hardware manufacturers to provide toll-free service in Europe. "If someone calls from France, we know in advance and answer the phone in French," Massey said. The company also started HP 1st, an automated fax-response system that enables customers to dial a toll-free number and receive data sheets and specs via fax.

"English is increasingly the language of business, but borders are still alive, regardless of the EC," said Frame's Doetling. "As far as Europeans are concerned, Dublin [Ireland] is as far away as New York."

Support must be invisible, said Doetling. "When Frame first entered the European market, we made Germans send registration cards to another country. They crossed out the address and sent them to the German distributor."

The so-called gray market creates support headaches for manufacturers. According to Doetling, FrameMaker sells in Germany for \$1,800 (about 3,000 marks), but only \$795 in the United States. MacWarehouse now sells FrameMaker at the U.S. price in Europe, but the customer gets no support. "The local distributor is very reluctant to support the gray-

market customer, and [users are] on their own when it comes to upgrades," Doetling said.

But to some, especially in the education area, localization doesn't matter. "Scientific research is done in English, and they're used to it," he said.

All abroad. The service situation will improve as more U.S. software companies continue to establish subsidiaries abroad. According to the International Computer Professionals Association of Washington, D.C., 80 percent of the software installed worldwide is from the United States. According to the Tokyo office of the American Electronics Association, U.S. software companies already control 75 percent of the packaged software business in Japan.

Overall, the trend is toward internationalization and globalization of software — in content, in laws and in service — but customer service and lawmakers can barely keep pace with the growth.

"Europe is almost 10 years behind in computing," Doetling said. "And both because of and in spite of that, the market is growing faster than in the United States."

Companies setting up shop overseas should check the warranty and service policies before they buy, be prepared to negotiate a deal with the manufacturer if they're a big customer, and shell out the bucks and buy locally.

"Product is cheaper in the United States, but you risk a lot. It pays to buy locally," said Radius' Kushner. "The biggest mistake a company can make is to source it all in the United States." □



JOHN SPRAGENS JR. / PHOTO RESEARCHERS

Shoppers in Alchibana Tokyo's electronics center can find good gray-market deals on computers; warranties and support are optional.

Legal standards *From Page 39*

business overseas — the very environment where a business most urgently needs to protect trade secrets and classified information.

Lotus Development Corp., for example, sells a compatible export version of Lotus Notes abroad with weaker security features.

"Customers are demanding strong encryption," said Lotus general counsel Tom Lemberg. "A customer may decide not to build the overseas business on a network

"DES is not a secret. I bought

a DES product for \$200 in

Moscow within hailing dis-

tance of Red Square ... It's too

easy to ship this technology."

— Tom Lemger, Lotus

if it poses a serious security risk. As the cost of hardware decreases and the power increases, the need for security increases. Now you can crack code on the desktop."

For the user who wants to avoid delays, paperwork and insecure systems without breaking the law, Chan's advice is to buy foreign-encrypted products, not U.S.-encrypted products. "It's the best tactic for the user, but the worst for the U.S. economy," he said.

The export of encryption technology remains as closely regulated as that of Patriot missiles. Cryptography is governed by ITAR — the

International Trading in Arms Regulation. A Cold War holdover, enacted in 1940 when encryption was rarely used by the general public, ITAR classifies cryptographic systems as munitions.

The legal difficulties that businesses face exporting software containing encryption algorithms has risen to the forefront since President Clinton announced a new directive on "public encryption management" in April.

"When exported abroad, [cryptography] can be used to thwart foreign intelligence activities critical to our national interests," the White House stated. The announcement, which outlined a plan for the so-called Clipper chip, a single encryption standard to which only the U.S. government would hold the key, is being hotly contested by the U.S. software industry (see MacWEEK, May 31).

Advocacy groups (such as the EFF; Computer Professionals For Social Responsibility of Palo Alto, Calif.; and the Software Publishers Association and Computer and Business Equipment Manufacturers Association, both of Washington, D.C.) have been meeting with federal officials to encourage them to rewrite or remove the laws. They called Clinton's announcement a step back that could seriously impair overseas expansion of the computer industry.

"We praise the Clinton administration for undertaking this basic inquiry into encryption policy, but the Clipper chip, while voluntary, could become the only type of encryption available," said Jerry Berman, EFF executive director. "It's not fulfilling the

law-enforcement and national-security mission, it's endangering the security and privacy of U.S. companies doing business overseas, and it's denying a market for our technology."

Passing borders without passwords. The result is costly and time-consuming delays both for software manufacturers that must create special "minimum-security" export versions of software and for U.S. businesses that must file extensive paperwork to mail even a single copy of encrypted software to a foreign office. For U.S. customers setting up systems overseas, it also makes it difficult to integrate information in a foreign subsidiary with their U.S. information.

Products that use cryptography primarily for password protection can be exported more easily than those that use cryptography to provide data confidentiality over LAN and WAN connections.

In 1992, the NSA relaxed export license restrictions for software products containing the algorithms RC2 and RC4, developed by RSA Data Security Inc. of Redwood City, Calif., enabling them to gain export approval in about a week. It was a dramatic improvement of a process that had previously taken months or years.

Software publishers and users, however, believe that a week's delay is unnecessary because the two most popular cryptographic algorithms — DES and RSA — are well-known, and products using those algorithms are being developed abroad. "Even if the Russians already have the technology, you can't ship it,"

Chan and Jodziewicz's Chan said.

Strength is related to the length of an encryption algorithm. If a business wants to ship software that uses a stronger algorithm (more than 40 characters) to an overseas office, it has to file separate paperwork for each copy and apply for a munitions license. While most software exports are regulated by the U.S. Commerce Department, those containing stronger algorithms, such as DES, and any product developed with the RSA tool kit are still strictly regulated by the State Department's Office of Defense.

"DES is not a secret. I bought a DES product for \$200 in Moscow within hailing distance of Red Square," said Lotus' Lemberg, who maintains that the regulations are still too restrictive. "Some genies you can't keep in the bottle. It's too easy to ship this technology. We don't think these rules should be eliminated but believe they need to be relaxed considerably."

Lemberg agreed. "It's a big hassle," he said. He recalls returning from a trip to Canada with an RSA developers tool kit on a laptop. U.S. customs officials refused to let him cross the border.

Software publishers such as Lotus face a costly dilemma. They must either hire lawyers and attempt to get the law changed, package and ship a separate export version with weaker security features, or eliminate the security altogether. This results in users abroad having a false sense of security and has created an overseas reputation that U.S. products are inferior because they use watered-down security features. □

Foreign software piracy difficult to control

Illegal duplication of software is an increasing concern to software businesses expanding into overseas markets. In many countries, such as Japan, Taiwan, Thailand and Russia, piracy is rampant, and it is not particularly absent from Western Europe, either.

Often, U.S. copyrights, trademarks and patents are not honored abroad, and copying intellectual property is not illegal. Bootlegged copies of everything from Adidas shoes and Madonna tapes to Lotus 1-2-3 and Aldus PageMaker are sold on the streets in Asia.

A sales representative from Paracomp Inc. (now Macro-media Inc.) traveling in Hong Kong's famed electronics row, a mile of neon-trimmed stores, was said to be stunned to find brazenly bootlegged, shrink-wrapped copies of the company's product on sale with photocopied manuals — for 10 percent of the U.S. price.

In a country where the cost of a single software product represents a year's salary, the motivation for blatant software piracy is easy to comprehend.

The Business Software Alliance, a software protection trade group in Washington, D.C., estimates that in 1992 the computer industry forfeited a whopping \$12 billion in lost revenue to software piracy.

To crack down on domestic counterfeit software, the Congress passed the Software Copyright Protection Act. The

new law, an extension of the federal copyright act, makes commercial piracy of software a felony and imposes a maximum fine of \$250,000 and as long as five years in prison.

Prior to this bill, software piracy was a misdemeanor, with significantly lower penalties.

There is no consistent international policy regarding the copyright protection of databases or personal information stored electronically, according to a study completed by the European Community Organisation for Economic Cooperation and Development of Brussels, Belgium. Fifteen of 35 countries surveyed by the OECD have policies or applications on the books for protecting databases. Twelve of the countries have permanent data-protection boards.

But many countries are just beginning to take action. On the Pacific Rim, Taiwanese officials have started a crash program to prosecute violators of U.S. copyrights, particularly those involving illegal software copying and licensing activities. In May, a much-publicized raid on video stores netted truckloads of pirated videotapes, which were publicly destroyed.

Sergei Bitelyevich, president of the Programmers Association of St. Petersburg, Fla., estimated that more than 95 percent of all software installed in Russia was acquired by means deemed illegal in the United States.

The government of Taiwan — a country where piracy has been prevalent — is also attempting to halt piracy by



Hong Kong's famed electronics row (Nathan Road) in Kowloon is well-known for its bootleg bounty.

requiring all software to be inspected before it is exported.

Under the U.S. Commerce Department Trade Representative office's so-called Super 301 section of U.S. trade law, failure to control software copying in piracy-plagued countries could lead to heavy tariffs on goods exported from those countries to the United States, unless prompt action is taken to protect copyrights, trademarks and patents. — By Gigi Bisson

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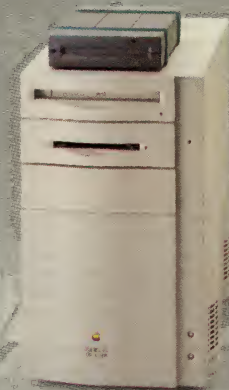
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EDITORIAL

What happened to innovation?

If you felt less than overwhelmed by Apple's latest round of PowerBooks, you aren't alone. Like most PowerBook faithful, we welcome the arrival of active-matrix color and cheaper models, but we cannot help but notice that there isn't much innovation in Apple's recent offerings.

In fairness, it's hard to turn out a revolution every six months. But when after two years Apple has failed to adopt even minor innovations embraced by other portable-computer makers, such as PCMCIA expansion slots, we begin to wonder.

Apple's colorful floor show looks pretty drab when you consider what slow progress the company has made in improving battery life, processor speed and expansion capabilities.

A lack of progress isn't the result of a lack of innovative technologies. Recent disclosures on pen-Mac technologies show that Apple does have cool stuff it could be adding to the PowerBook line. And adding PCMCIA to portable Macs cannot represent much of a challenge for

the company that brought us the Duo docking system, a marvel of software and hardware integration.

We must conclude that it is fear of making a mistake, of jeopardizing the company's No. 1 position in the portable market, that has given Apple cold feet. It's safer to tack on a color screen, one that the portable's power system is ill-prepared to support, than it is to redesign for pen input. After all, a pen-based PowerBook might fail to garner the numbers Apple is looking for. And if successful, it might endanger Newton sales.

The result is that the "rapid turns" of new PowerBook models promised by Randy Battat, Apple vice president of portable computing, brings us a slightly cheaper 145 — a unit still priced far above other vendors' entry-level portables.

If fear is the motivating factor in why our PowerBooks don't offer the longer battery life and PCMCIA expansion available to Windows notebook users, then Apple should beware. It took bold action to become the market leader. Only bold action will retain that position. □

My Turn by Marie D'Amico

The reasons Apple should have won Microsoft lawsuit

Earlier this month U.S. District Judge Vaughn Walker all but put the Apple-Microsoft Corp. lawsuit out of its misery. Although Apple is appealing the judge's decision, after five years it now seems unlikely that this case will ever be brought before a jury.

Too bad. Considering its market share, there was a better-than-even chance that 12 randomly selected people would have just gotten an "unexplained application error" from Windows. Or we could have gotten 12 Simi Valley types who don't think crimes are crimes when they're committed by a majority.

We'll probably never know. Still, I believe Apple had a decent shot at winning a jury trial, once the case's history was heard.

Of mice and Microsoft. In 1985 Apple saw Windows 1.0 prior to its debut. Apple got that *déjà vu* feeling all over again. While Apple was giving Microsoft preferential treatment in its Mac application development, Microsoft was secretly trying to port the Mac interface to DOS. Windows 1.0

wasn't a pixel-for-pixel port, but it was the best Microsoft could do. After all, the company was saddled with the DOSasaurus, and it really believed tiled windows were "cool."

Apple threatened to sue. Microsoft threatened to stop work on Mac software. Apparently Apple needed Word more than Microsoft needed what was half its yearly revenue, so Apple caved. Microsoft admitted that Windows 1.0 infringed Macintosh, and Apple gave Microsoft a license to Windows 1.0.

Two years later, Apple saw Windows 2.0 and agreed with Microsoft's earlier admission. Windows was infringing. It sued.

Enough Smalltalk. The rest has been extensively documented in the news. But what has been forgotten is how much of the original playbook Microsoft took from Apple.

You can see it by looking at Smalltalk and Star, Xerox PARC's (Palo Alto Research Center's) graphical user interface.

Actually, Smalltalk/Star shouldn't even be a bench warmer in this game. But rumors of Apple stealing from PARC keep getting published by those who were in junior high when PARC was trying to invent cold fusion.

Smalltalk has overlapping windows with tabs on the left-hand corners and pop-up menus. It's a vanilla GUI. There's no menu bar, no desktop applications, no dialog boxes, no icons, no animation. It looks like Mac if you can't see the big "E" on the eye chart.

Star is a tiled, shy sibling of Smalltalk with icons. It didn't come out to play with the Finder team. They didn't even know what it looked like. Ask 'em.

One look at Windows 1.0 and you see a Finder wannabe, not a Smalltalk clone. In the Finder, when you click the mouse over a radio button, a circle appears in the center. Surprise! It looks the same in Windows 1.0. And what window would be properly dressed without a close box, title bar, scroll bars and size box like the Finder's?

Windows 1.0 didn't score. So Microsoft spent the next seven years reglazing Windows, getting it even closer to the Mac. By 3.0 it was almost right, except for the Program Manager/File Manager schizophrenia. And Microsoft reaped the rewards.

If Microsoft stole less and invented more, it could make its *own* GUI. And if writers invented less and investigated more, we wouldn't read of a teen-age Mac team stealing PARC secrets while on covert missions to the orthodontist. Wait. I see a TV pilot here — "Doogie Howser, Ph.D." Or has somebody already thought of that? □



Marie D'Amico is a computer-intellectual-property lawyer and an industry insider.

LETTERS



Quadra PowerPC upgrade: Deeds speak much louder

The editorial "Don't abandon Quadra owners" (MacWEEK, May 24) throws up a red herring by implying that Apple is not working on PowerPC upgrades for Quadra owners.

Rest assured that PowerPC upgrades for our installed base — including Quadra owners — are a top priority at Apple and that we are devoting considerable energy and attention to making sure there are various upgrade options for existing Mac customers.

Naturally, we realize our high-end users are particularly interested in upgrades. This is one reason why the new Workgroup Server 95 is available as an upgrade for the Quadra 900 and 950.

As you mentioned in your editorial, Apple has a "commendable record" in terms of offering hardware upgrades and software enhancements to its installed base.

We recently made a public announcement at the Apple Worldwide Developers Conference that Apple-labeled upgrades will be available for the Performa 600, Centris 610 and Centris 650, Quadra 800, and Mac IIvx and IIvi computers. Apple and third parties are working together to create upgrade paths for as many Macintosh models as possible, including the Quadra 700, 900 and 950.

We're hard at work providing appropriate upgrades, and as soon as more information is available, we'll let you know — unless you let us know first.

*Eric Harslem
Vice president, Desktop Systems
Apple
Cupertino, Calif.*

The editorial raised two concerns: the absence of the Quadras from the list of models for which Apple has committed to providing PowerPC upgrades and the company's apparent decision not to release SCSI Manager 4.3 for existing machines. Apple could prove the editorial a "red herring" and, more importantly, allay the concerns of Quadra owners by doing two things: stating forthrightly that it will offer PowerPC upgrades for the Quadras and committing to delivering the new SCSI Manager for them. Eric Harslem's letter, for all its reassuring words, does neither. — Ed.

Has Don Crabb succumbed to Siskel & Ebert syndrome?

Perhaps this is merely a side effect of Apple's forays into the consumer-electronics and entertainment industries, but it appears that Don Crabb is starting to sound a lot like Roger Ebert (MacWEEK, May 24).

I can almost hear it now. "Well Jean-Louis, I don't know how you can think that Apple is

wasting its time putting its operating system on Intel. When I screened the Intel chip, I felt it was well-directed and brilliantly produced — a definite thumbs up!"

To which Jean-Louis (a.k.a. Gene Siskel) might reply: "Given the lemminglike nature of the Intel-based PC market, the only way that the Apple OS is going to succeed on Intel is to call it Windows. I give this idea a thumbs down. Now let's move on to this week's next review: multimedia client-server digital assistants."

*Michel Floyd
Vice president of research and development
Endpoint Marketing Information Systems
Cupertino, Calif.*

PB 145B sans system floppies is a false economy for users

I am quite surprised that the story "June PowerBooks straddle low, high of price spectrum" (MacWEEK, May 31) did not scold Apple for migrating the "Performa syndrome" — the practice of not including a set of master system disks — to the PowerBook 145B. It's bad enough that these disks are not included with the Performas, which are marketed as though they are easy to set up, completely disregarding the "required" system backup process. But for Apple to start duplicating that "Microsoftian" marketing tactic in other models is outrageous.

Apple has come a long way in power and pricing over the years, but somehow it has hired a bad batch of marketing types and is now at risk of driving away its earliest and best customers. The list of sins is long: Macs discontinued a few months after release; lack of system disk sets with the purchase of some models; charging an excessive amount for system software (System 7.1 should be no more than \$20, especially since most of the new extensions coming this year will require 7.1); and ignoring the large number of existing StyleWriter owners by refusing to make GrayShare generally available. These policies and more have contributed to the death (or near death) of the volunteer Mac evangelists and a general lack of enthusiasm from long-time Mac buyers.

Perhaps MacWEEK should research a story on the marketing strategies apparently being used at Apple. Such a story could determine just how much Apple thinks it is shaving off the cost of a Mac by withholding system disks.

Dave Martin

Send letters to MacWEEK, 301 Howard St., 15th Floor, San Francisco, Calif. 94105. MCI 323-1203; Internet, letters@macweek.ziff.com; fax (415) 243-3650. Include your name, address and phone number. Letters should not exceed 300 words. We reserve the right to edit for clarity and length.

The Mac Manager

Plan Mac purchases well: It's going to be a bumpy ride



DON CRABB

The personal computer industry is in chaos right now, and Apple is right at the heart of the confusion. This situation results from gonzo marketing, cutthroat pricing and new technologies emerging so fast that no one can keep track of them.

Should you buy Centris machines now or wait for Cyclones this summer? Should you ante up for PowerBook 180 machines today or wait till the 180c machines ship? Should you pop for Quadra 800s, only to watch them eclipsed in six months by Macs running the PowerPC 601 chip? And what about upgrades?

It has gotten so bad that Macintosh managers are deferring purchases because they just don't know which way to go with these or any buying decisions. As a result, sales of some Mac products are well below expectations. How does Apple react? By lowering prices on the slow movers, which unfortunately makes the selection and buying process only more confusing.

If there was ever a time to do some serious purchase planning, that time is now. Because the market is so confused, you can't count on "common sense" to get you through because the term has no meaning in this climate.

To start getting a handle on things, I offer a five-point strategic plan that you should be able to adapt to your individual buying circumstances.

► **Ignore the advice to wait.** Much expert advice is going around now that you should "wait for a few [days, months, years] to buy." I say *nyet* to all that. Waiting buys you nothing in today's changing marketplace, except the lack of some better equipment than what you have now.

► Stop whining.

"Apple is coming out with too many new models. Just when I bought my Centris 650, I find that the same money will buy a Cyclone later this year." So what? Would you rather that Apple revert to its old ways and release new models every other year? Sure, it's annoying to have new models introduced willy-nilly, and, yes, the constant price dropping ticks us all off — no one enjoys feeling burned. But a new model doesn't make the Centris you just bought any less capable.

► **Outplan Apple.** Since Apple is shooting in the dark, hoping that one of its many product strategies will hit some mark, you have at least as good a chance of guessing how those product strategies will evolve. Look at what Apple has done in the past year, the past six months and the past three months. Compare that with what has been leaked and what has been promised. Somewhere along the way you can discern the truth about the efficacy, delivery dates and prices for things such as PowerPC-based Macs and PowerPC Mac upgrades.

► **Hedge your bets.** Don't put all your strategic desktop plans into one basket. Don't expect to milk a specific technology for all it's worth, no matter how hot it is. Plan projects and equipment acquisition around a basic strategy to keep things diversified yet still moving forward.

► **Have some fun.** Despite all your planning, you'll still find that you've "wasted" money in some Scroogian sense. But don't sweat it — you'll do better next time. And maybe, eventually, some sanity will return to the desktop computer market. □



"That's great. Now make it look like it wasn't done on the computer."



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Dayna SafeDeposit products guard data on full-time basis

Applications seek to help minimize data loss by allowing for backups on a variety of schedules.

score card

SafeDeposit and SafeDeposit Server

Dayna Communications Inc.
Version tested: 1.2
List price: \$189*
Overall value ♦♦♦

SafeDeposit and SafeDeposit Server are full-time backup products intended to complement, not replace, your current backup strategy. You can back up critical files continuously, at a specific time, on command, at shutdown or upon disk insertion. The products, which work by copying user-specified files to another desktop volume, are a good fit for use with high-density removable media such as SyQuest or magneto-optical cartridges. Both work with Fifth Generation Systems Inc.'s DiskDoubler to automatically compress files. The biggest drawbacks are that backups cannot be performed in the background and files cannot be backed up according to date or split across multiple volumes.

Performance ♦♦

Features ♦♦♦

Ease of use ♦♦♦

Documentation/support ♦♦♦♦

* Introductory pricing through July 1: \$99 per user; \$229 per server; 10-pack, \$399. After July 1: SafeDeposit, \$189; SafeDeposit Server \$449; 10-pack (10 users, one server), \$699; 50-pack with server, \$2,749; 100-pack with server, \$3,999; SafeDeposit Server five-pack, \$1,495.

R A T I N G S K E Y

- ♦♦♦♦ Excellent
- ♦♦♦♦ Very good
- ♦♦♦ Good
- ♦♦ Fair
- ♦ Unsatisfactory

By Jonathan A. Oski

No matter how religious you are about backing up your data, the day will come when an unexplainable system mishap eats the file you just created. If, like most savvy users, you perform backups on a daily basis at best, you may have just lost as much as a day's worth of work.

SafeDeposit and SafeDeposit Server, two full-time backup products from Dayna Communications Inc., attempt to help minimize data loss by letting you perform backups on a variety of schedules.

SafeDeposit, which lists for \$189, is a stand-alone product that can run on virtually any Macintosh, networked or otherwise. It is not intended to replace products such as Dantz Development Corp.'s Retrospect. Rather, it can complement your existing backup regimen by making copies of critical files between your normally scheduled backups.

SafeDeposit Server, a companion server product that lists for \$449, runs in conjunction with AppleShare 2.0 or 3.0, or System 7's Personal File Sharing and backs up files while the server is running. (Because SafeDeposit Server provides basically the same features as SafeDeposit, in this review we refer to SafeDeposit Server only when describing a function specific to it.)

SafeDeposit's minimum requirements are a Mac Plus, System 6.0.7 and 2 Mbytes of RAM. It operates as a system extension and requires 500 Kbytes of RAM.

Both products work by copying files that you specify to any Finder-mountable volume. This means that you cannot use SafeDeposit to back up to tape unless you use a product such as Optima Technology Corp.'s DeskTape, which lets you mount tape drives on the desktop.

Installation. Installing SafeDeposit, which is handled by Apple's Installer utility, is quick and easy and well-documented in the manual that accompanies both products. There's little need for customization; options depend only on which system software you're running. The two products cannot be run simultaneously on the same workstation (for instance, where

you might use SafeDeposit on a network node in conjunction with Personal File Sharing).

After you install the programs, you must initialize them. At the first launch, you are prompted to enter the serial number from your disk. This is not too annoying for a one-time server-based installation, but we think those who purchase SafeDeposit for all of their network nodes will find this a bit tedious. For SafeDeposit Server you must also supply the AppleShare Administrator password so the application will have access to all the files on the server.

Setting up defaults. After supplying the serial number, you are prompted to initialize the base configuration, providing SafeDeposit with instructions on which files you want backed up, the backup schedule time, the destination

OrangePC squeezes 486 juice from Mac

Integration problems hamper NuBus card

By Steve Michel

In an ideal cross-platform world, a computer would run MS-DOS, Microsoft Windows and Apple's System 7 all in one box and all at full speed. It would also have full and seamless communications between the different systems so that exchanging data would be as easy as cut and paste or drag and drop.

There are a number of solutions for creating seamless Macintosh-to-PC integration, not least of all the various flavors of Insignia Solutions Inc.'s SoftPC, Mac software that emulates an IBM PC or compatible (see MacWEEK, March 15). A more ambitious, more costly and potentially more powerful solution comes from Orange Micro Inc. in the form of its recently shipped OrangePC NuBus board, the successor to its Orange 386 (see

MacWEEK, May 14, 1991). This is a nearly complete PC with its own processor, video support, expansion slot, and parallel and serial ports, designed to run inside an existing NuBus-equipped Mac.

The \$1,799 OrangePC we tested came configured with a 486SLC

processor running at 25 MHz, 10 Mbytes of RAM (expandable to 16 Mbytes) and one AT-type expansion slot. The board uses the Mac monitor, keyboard, mouse and hard disk. An entry-level version, priced at \$1,099, is based on a 16-MHz

See OrangePC, Page 51



Initialize SafeDeposit

Through a series of dialog boxes we're going to ask you four simple questions to set up SafeDeposit's default operating parameters.

1. WHERE do you want to keep your backups?
 2. WHEN do you want to make backups?
 3. HOW do you want to perform your backups?
 4. WHAT do you want SafeDeposit to back up?
- Cancel Done

The initialization process for Dayna's SafeDeposit establishes defaults for how backup queues will be handled and sets up your initial queues and other backup criteria.

volume, compression options, and whether you want full or incremental backups. This process establishes your backup defaults and sets up your initial queues (files or groups of files that you want copied to specific locations at particular times). Of course, you can change any of these options for a particular queue at a later time.

Normal operation is handled by a system extension that occupies 185 Kbytes of system heap space. Once you've configured SafeDeposit, you run the application only to change defaults.

SafeDeposit queues can include individual files, folders or entire volumes. SafeDeposit Server also lets you specify queues based on users or groups so that all files owned by a user or group can be scheduled for backup. You can also specify files that should never be backed up.

Files that SafeDeposit will not back up include invisible files, empty folders, files in the Trash or temporary files. SafeDeposit will also not back up open files other than System files, unless you specify so. This option is important if you want open

See SafeDeposit, Page 49

score card

OrangePC

Orange Micro Inc.
Overall value ♦♦

List price: \$1,799*

The OrangePC NuBus card presents a useful way to get DOS and Windows programs running on your Macintosh and provides good performance. The product's good hardware design and fast performance is undercut by unfinished software, however, which degrades its usefulness by omitting important connectivity tools for communicating between Mac and DOS environments. We recommend waiting until these missing pieces ship before committing to this product.

Performance ♦♦

Features ♦♦

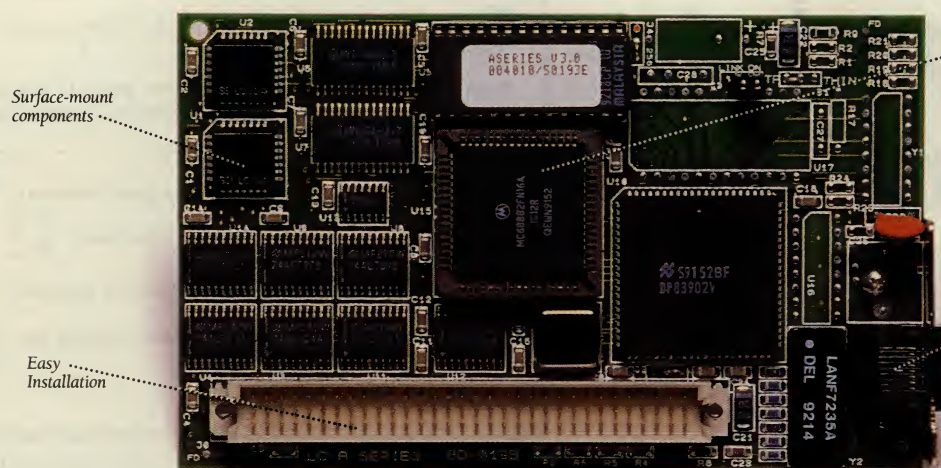
Configuration ♦♦♦

Ease of use ♦♦♦

Documentation/support ♦♦♦

* As reviewed, with 486SLC-25 processor, 10 Mbytes RAM and one AT bus slot; midrange version, based on 25-MHz 386SX, \$1,499; low-end configuration, based on 16-MHz with no ports or slots, \$1,099.

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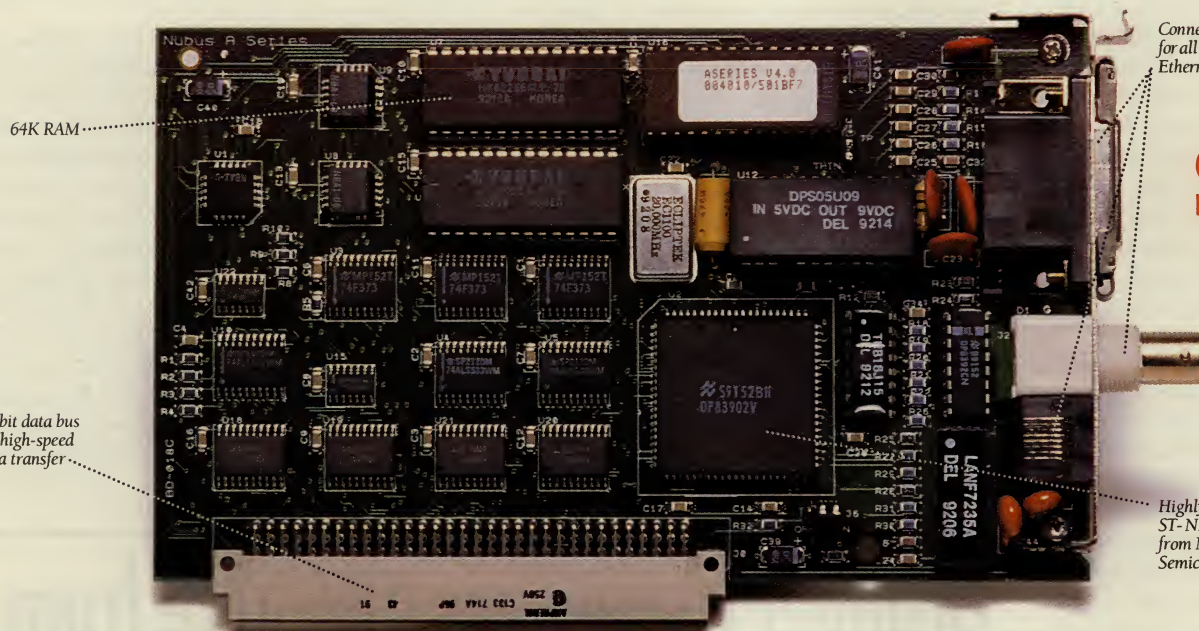


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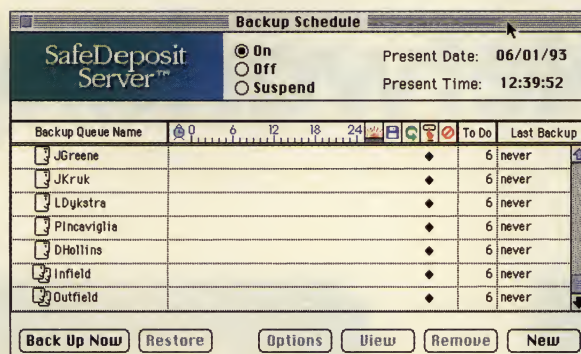


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With SafeDeposit Server you can specify backups based on files or groups of files. In addition, you can specify files to be backed up based on their owner or group.



SafeDeposit

From Page 47

files, such as databases, to be backed up throughout the day.

SafeDeposit can back up files to any desktop volume, including AFP (AppleTalk Filing Protocol) servers. By specifying an AFP volume as the destination for your backups, you can work on documents locally and have them automatically backed up to a server. SafeDeposit stores your AFP user name and password so it can mount the volume when necessary.

When one backup is not enough, SafeDeposit Server lets you create multiple synchronized backups of the same file. You can use SafeDeposit on the client to back up to the server and then have SafeDeposit Server copy these same files to another destination.

SafeDeposit offers many flexible scheduling options. You can have backups performed continuously, at a specified time, on command, at shutdown or upon disk insertion. You cannot, however, schedule backups to occur based on the file's last modification date, an option we think should be included in any backup utility.

SafeDeposit will work with Fifth Generation Systems Inc.'s Disk-Doubler compression utility to help save room on your destination volumes.

We were particularly disappointed, however, that SafeDeposit cannot split files. This means that the destination volume must have enough space to hold the files you want backed up. The flip side is that all files backed up by SafeDeposit are preserved in their native format.

Your safest bets. While SafeDeposit can be used as your sole means of backup, we believe it's best used to complement a periodic comprehensive backup to more conventional media such as tape. SafeDeposit is ideally suited to cases where your data is stored on volatile media, such as a RAM disk, or when you need more- or less-constant backups of critical items that change in the time between your comprehensive system backups. SafeDeposit can also be used to free people to work from their local volumes and have their work copied to the server.

SafeDeposit also works well for people who travel or use several different computers. You can have SafeDeposit create a backup whenever you insert a disk in the Mac and have your files copied to a disk or other removable medium. You can use this same approach when you want to copy files from your PowerBook.

Shortcomings. While it's a handy utility, SafeDeposit is not without its shortcomings. Most notably, it doesn't perform in the background; SafeDeposit will take over your workstation whenever it's called upon to perform backups. This may not be too annoying when

you have just a few files to copy, but if you have a lot, it can take almost as long as it would if you used the Finder to copy the same files.

Restoring files poses another potential problem. Since SafeDeposit's files are stored in their native format, you can quickly restore from your live backups if the need arises. However, if you try to restore a file from a disk and you don't turn off SafeDeposit first, inserting the disk may trigger a backup that writes over your "good" copy of the file. Dayna cautions you to use SafeDeposit's built-in restoration features because they give you more control over backups.

Documentation and support.

Both products' manuals are brief but comprehensive, and the several calls that we made to Dayna's service line were handled well.

Conclusions.

SafeDeposit serves as a good adjunct to a solid comprehensive backup application. While there are hardware options to perform dual-writes to multiple media for those instances where full-time backup is necessary, we think that SafeDeposit offers a more flexible and economical solution for wide-scale deployment.

The product would be less intrusive if background backups were allowed. Also, while backups can be scheduled to occur at a variety of times, they cannot be performed on files using any date logic, an omission we would like to see fixed. We also think that the serialization scheme could become unwieldy in larger installations. But for those occasions where you cannot turn to your regular backup program to bail you out, SafeDeposit and SafeDeposit Server are the right solutions.

Dayna Communications Inc. is at Sorenson Research Park, 849 W. Levoy Drive, Salt Lake City, Utah 84123. Phone (801) 269-7200; fax (801) 269-7363. □

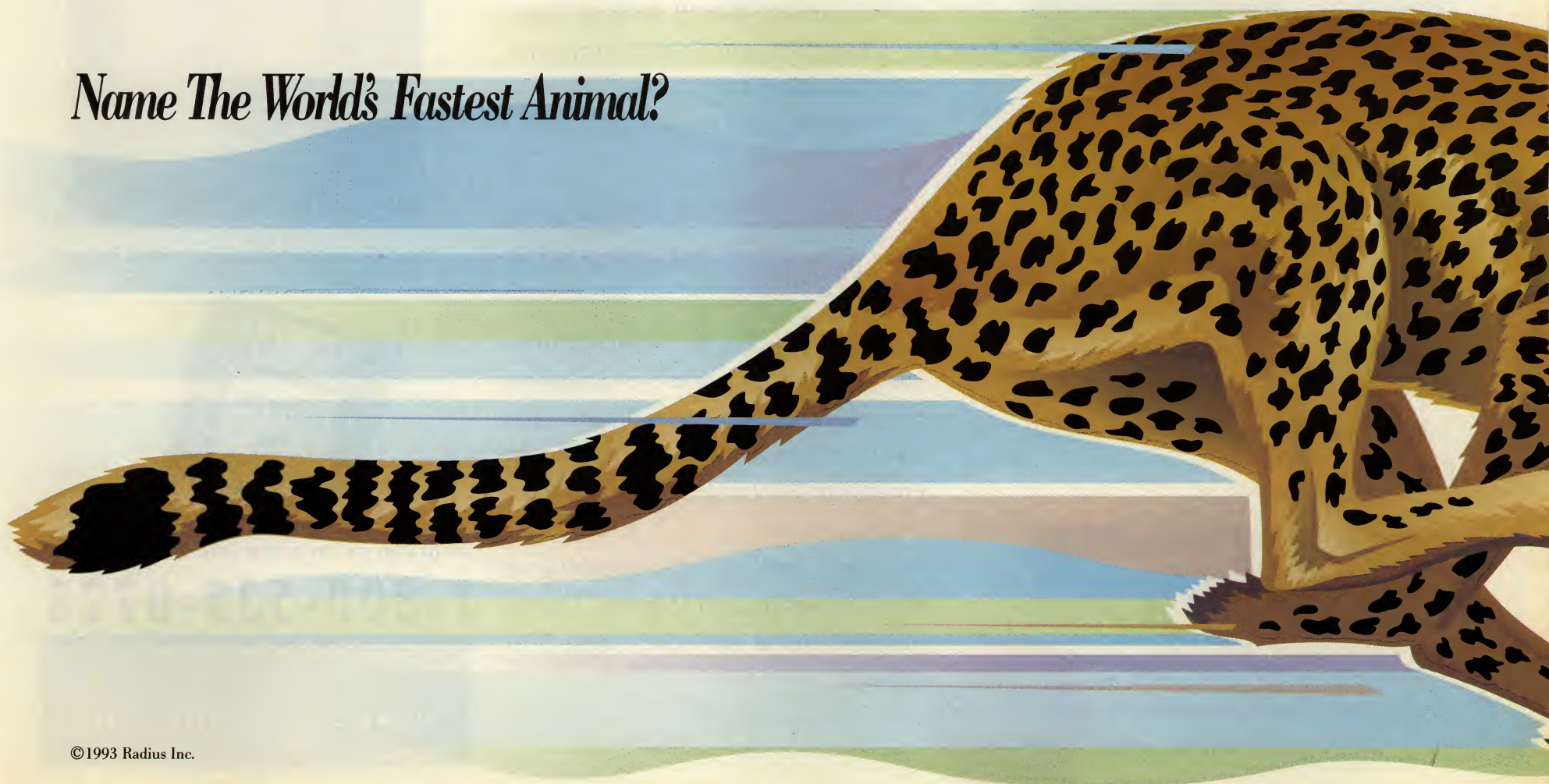
SYSTEM 7 COMPATIBILITY

SafeDeposit 1.2 SafeDeposit Server 1.2

Balloon help	No
TrueType	n/a
Publish and subscribe	n/a
Apple events	Yes
32-bit addressing*	Yes

*According to vendor.

Name The World's Fastest Animal?



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Radar

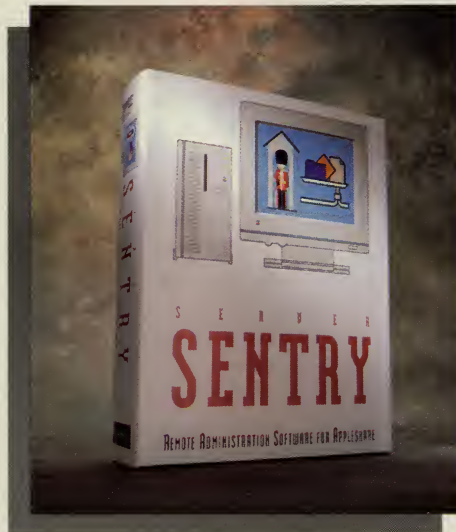
Topology Map of your entire network? No problem. Upgrade software remotely? Definitely. Asset reports? Piece of cake. Download/Replace/Delete software to user's Macs? Yep, that too. In fact, Radar lets you do many network management activities from the comfort of the Mac on your desk. And everything is point-and-click so its really easy to use, too.

Bridge Series

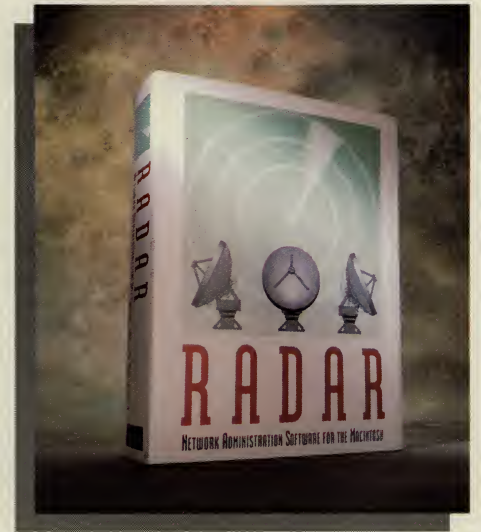
What do you do with your LocalTalk devices (like printers, PowerBooks, etc.) when you migrate your



MacUser
March '93



Remote AppleShare Management



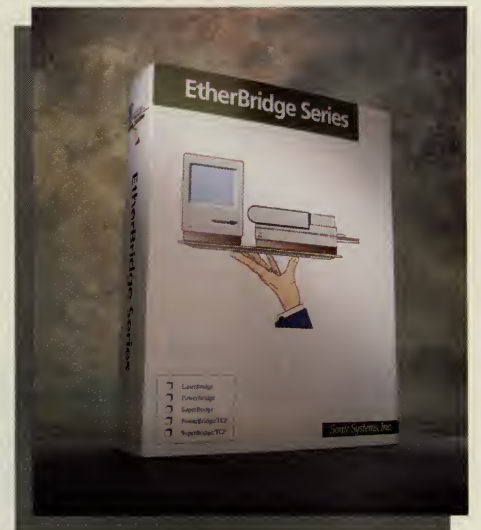
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LocalTalk to Ethernet/TokenRing Bridge



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Sonic Systems, Inc.

OrangePC

From Page 47

386SX processor and has four SIMM slots but no ports or card slots. A midrange model, priced at \$1,499, has a 25-MHz 386SX processor, four SIMM slots, serial and parallel ports, 2 Mbytes of RAM (expandable to 16 Mbytes), and an expansion slot.

The boards support protected mode and extended memory (which is required by Windows 3.1), unlike SoftPC, which supports these features only in its Quadra version. Orange's boards ship with DOS but not with Windows.

With the exception of the hard disk, the performance is nearly independent of the Mac itself. The OrangePC accesses the hard disk through the Mac's filing system, which slows it down somewhat during disk-intensive operations. On the positive side, this lets you switch between the Mac and PC seamlessly. You can have one processing in the background while you work in the other's window in the foreground.

OrangePC's disk requirements are modest. You'll need 5 to 10 Mbytes for DOS (and Windows if you choose to use it), plus room for your applications and data files.

This PC volume appears as a locked file when accessing the disk from the Mac.

The AT-type, 16-bit interface slot on the board is intended primarily to provide a way for the "PC" inside the Mac to be a full network citizen, but it also opens other possibilities. For example, the board could be dedicated to running either the client or server side of database software. The slot could also hold specialized interfaces, such as those for data acquisition devices not available to Macs. Since OrangePC really does give users two computers in one, there are a lot of possibilities for combining intensive tasks on both the Mac and PC sides.

Performance of the OrangePC board is good, although not breathtaking by PC-compatible standards. In Ziff-Davis Labs' WinBench benchmarking tests, the OrangePC's screen speed was more than 1.6 million pixels per second. Symantec Corp.'s Norton Utilities 6.0 gave the CPU a rating of 39.3, compared with the original IBM PC (which rated a 1.0). Clearly, this kind of performance is very good, and for some memory-based tests (Microsoft Excel recalculations, for

example), it provided better performance than the same tests running in native mode on our Mac IIx with a DayStar Digital 50-MHz '030 accelerator.

The software needed to manage the 486 board requires 512 Kbytes of Mac memory, so it can be installed on virtually any Mac with a NuBus slot.

Green fruit. Despite the potential benefits of the product, which are considerable, we were disappointed by the immaturity of the software that is needed to provide the Mac-to-PC integration. If this software were more fully developed, the board would really shine. Orange Micro is working on many of the problems we found, but the board has been shipping for several months while promised software has yet to be delivered.

First, there's the issue of sharing files between Mac and PC operating systems. With the shipping version of the software, only one mechanism is supported: floppy disks, of all things. To get a file from the PC "drive" you must copy the file to a DOS-formatted floppy in your Mac's floppy drive, which the OrangePC board recognizes as

OrangePC Setup

Video Setup: Onboard VGA Mode NOT SUPPORTED

Floppy Disk Drive A: Emulate 1.44M

Floppy Disk Drive B: None

Hard Disk Drive C: None
Mr. Jones' OrangePC Drive C

Hard Disk Drive D: Emulate
Supplemental Files Drive D

Mouse: Emulate a 2 Button PS/2 Mouse

Changes only take effect after a Cold Boot.
(Warning! A Cold Boot resets the PC).

The OrangePC configuration dialog lets you create new files to serve as virtual DOS disks and lets you control how the Macintosh mouse is emulated for DOS and Windows.

Drive A. You then switch to the Mac window and read the file from the floppy disk using Apple File Exchange, Insignia Solutions Inc.'s AccessPC, Dayna Communications Inc.'s DOS Mounter or another translation application.

This alone nearly neutralizes any potential advantage of the board. It is a real nuisance and is no great improvement over having a second CPU on your desk. We have seen a "soon-to-ship" beta of new software that allows for file sharing between Mac folders and OrangePC, and it worked well. Any folder on a Mac hard disk (or network or CD-ROM) can be seen as Drive E, F or G on the PC. Given its importance, we expect Orange to hustle this software to completion.

A related problem is printing. Insignia's SoftPC allows DOS and Windows software to use Mac printers by intercepting printing jobs sent to one of the PC "ports" and redirecting them to Mac printer software. OrangePC, in contrast, can print to devices only directly connected to the OrangePC board or to a network interface board. When we went to press, Orange Micro was also working on this software, which it said will ship sometime after the file-sharing software.

Orange Micro is also working on software that will let you copy and paste text between the Mac and the PC, the third missing rung in OrangePC's ladder to success. As with the sharing feature,

See OrangePC, Page 53

Name The World's Fastest Car?



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here at Earth Lovers Landscaping, when I discovered money doesn't grow on trees.

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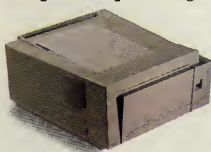
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*Time savings are all based on a 10-person office.

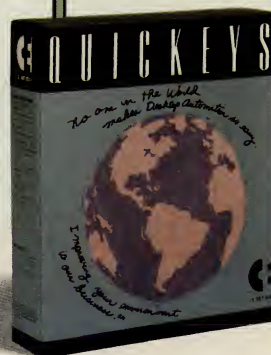
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Also available for DOS and Windows™ as ProKey.™

OrangePC

From Page 51

this is currently in beta testing.

We would also like graphics clipboard support, although this would have fairly limited value, given the board's other major limitation, video. OrangePC supports displays of only 16 colors (the low end of the VGA-standards spectrum). Given that most color Macs can handle 256 colors or more, this seems inadequate. And when you switch to the OrangePC window, the color depth of your Mac screen switches to 16 colors, and the color palette is set to match that of the DOS or Windows system. Orange Micro said this is done to ensure the fastest-possible display. The display is fast, but it is quite limiting to those who require Mac or Windows displays of greater depth. For stand-alone users who need to support PC graphics applications, the AT expansion slot could be put to use for a video board at the expense of a network connection. This approach doesn't cause the 16-color problem.

Documentation and support.

The documentation for installing the OrangePC board is scant, but it gives you the basics for

installing and using the product. DOS 5.0 is included with the board, as is Microsoft Corp.'s 170-page Concise Guide to MS-DOS. Overall, the installation was fairly quick and easy. Our calls to technical support were answered by people who understood the product. Orange Micro promises that the upgrades to address the problems we mentioned will be free to registered users.

Conclusions. At \$1,799, OrangePC isn't cheap. Stand-alone PCs equipped with a monitor, hard disk, keyboard and more interface slots are in the same price range. Since communications between the board and your Mac are extremely limited with OrangePC, a stand-alone PC with a simple null-modem cable and translation software is a better buy if you need it now. However, if PC compatibility inside your Macintosh is a priority, and you can put up with the missing software pieces until upgrades are released, the OrangePC should offer a good solution.

Orange Micro Inc. is at 1400 N. Lakeview Ave., Anaheim, Calif. 92807. Phone (714) 779-2772; fax (714) 779-9332. □

'PCs' in a Macintosh: Hard and soft solutions

Orange Micro Inc.'s OrangePC invites direct comparison with Insignia Solutions Inc.'s SoftPC (see MacWEEK, March 15). Since OrangePC is virtually a PC on a board and Insignia's product emulates a PC in software, it's no surprise that there's a wide performance gap between the two systems. Also not surprising is the price difference: Orange's boards cost from \$1,099 to \$1,799, depending on configuration, while Insignia's SoftPC products cost from \$165 to \$499.

We ran Ziff-Davis Labs' WinBench benchmarking utility on the OrangePC board, as we did with SoftPC. OrangePC clocked a respectable 1.6 million pixels per second, seven times faster than SoftPC running on a Quadra 950. (Unlike SoftPC's, OrangePC's performance is largely independent of the speed of the host Mac.) But in this test, the OrangePC still did not perform as well as our generic 25-MHz 386 machine — a slowpoke compared with the low-priced 33-MHz-and-better 486 machines flooding the market.

Despite its middling speed, OrangePC offers another big advantage over the very slow SoftPC: an expansion slot. This lets

users attach PC-based interface boards, which greatly improve the product's flexibility.

On the other hand, some aspects of Insignia's implementation are better than Orange Micro's, most notably the greater maturity of Insignia's software package. This is no surprise, given Insignia's long-term experience creating PC-to-Mac connectivity products. The shipping version of the OrangePC program doesn't have all of the important capabilities of the SoftPC software, such as file sharing, printing to devices connected to the Mac and clipboard support. Some of these shortcomings will be addressed by Orange Micro with new software. But while SoftPC supports Windows desktops with as many as 256 colors (albeit slowly), OrangePC has fast video that displays a paltry 16 colors.

Neither of these products offers the price and performance of a dedicated PC connected to a Mac with Farallon Computing Inc.'s Timbuktu, which, for many sites, is an unbeatable combination (see MacWEEK, Dec. 7, 1992). If you absolutely need compatibility in the same box, however, and you don't need to run

performance-intensive software, then Insignia's SoftPC is the better choice. If you need high-performance compatibility, OrangePC will be your best solution, assuming the software is brought up to the task.

Insignia Solutions Inc. is at 526 Clyde Ave., Mountain View, Calif. 94043. Phone (415) 694-7600; fax (415) 964-5434.

Farallon Computing Inc. is at 2470 Mariner Square Loop, Alameda, Calif. 94501. Phone (510) 814-5000 or (800) 998-7761; fax (510) 814-5020.

— By Steve Michel

score card

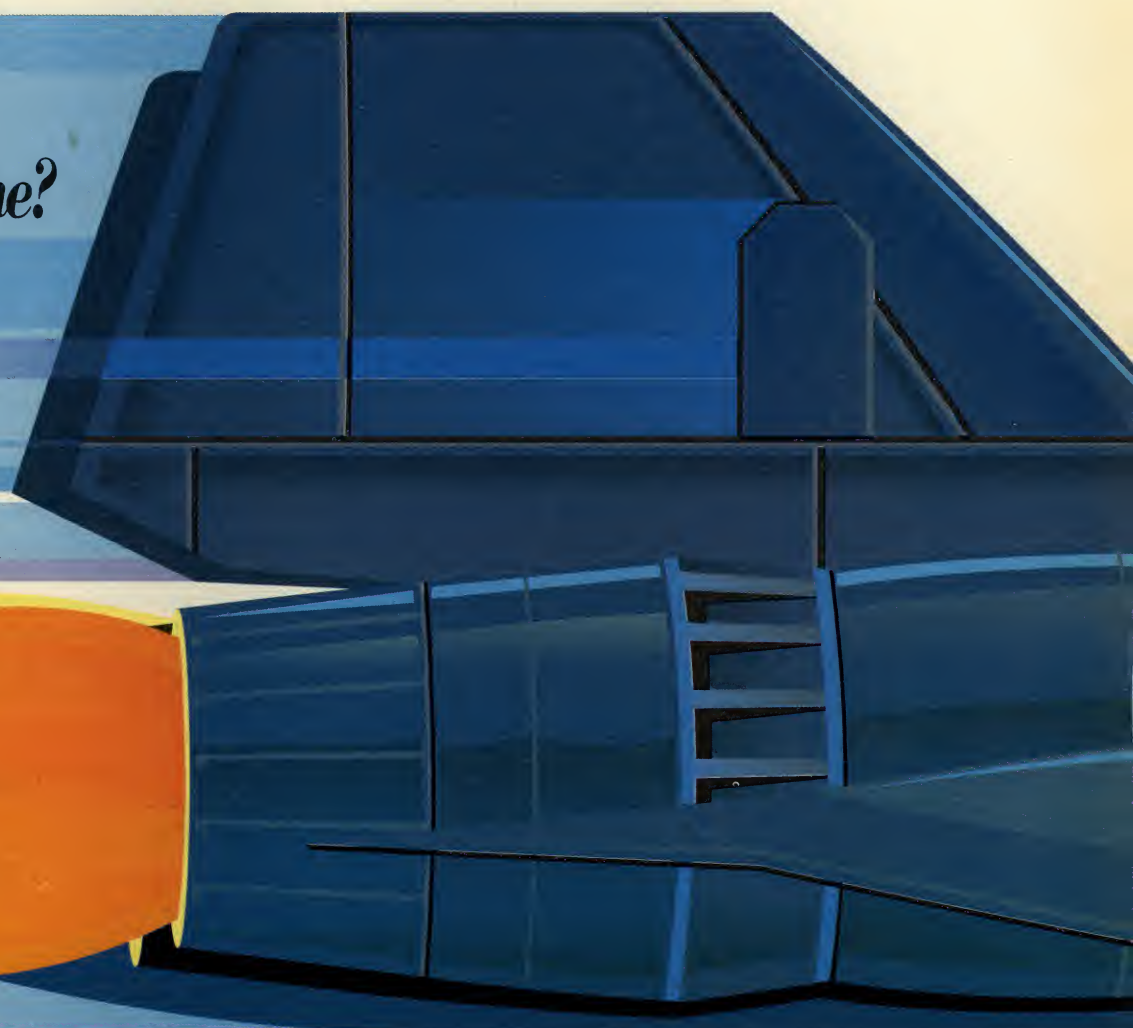
SoftPC

Insignia Solutions Inc.
Version tested: 3.0
List price: \$499*
Overall value ♦♦

Performance ♦
Features ♦♦
Configuration ♦♦♦
Ease of use ♦♦♦♦
Documentation/support ♦

* Universal SoftPC, \$165; SoftPC Professional, \$325.

Name The World's Fastest Airplane?



Comparison

Double-speed CD-ROM drives put new spin on performance

MacWEEK rates drives from Apple, MacProducts USA, NEC Technologies, PLI and Procom.

By Philip Bishop

Until about a year ago, the maximum throughput for a CD-ROM drive was 150 Kbytes per second. This was fine when the content was just text or audio, but with still images, animation and video now common features of many CD-ROMs, the need to process larger and more-complex chunks of data has made the previous generation of CD-ROM drives appear painfully slow.

One way manufacturers have found to break through this bottleneck is by doubling the spindle speed and using a decoding chip to cope with the increased flow of information, which effectively doubles the data transfer rate to 300 Kbytes per second.

We tested five double-speed drives: Apple's \$599 AppleCD 300, MacProducts USA's \$599 Magic CD-ROM Drive 3401, NEC Technologies Inc.'s \$615 MultiSpin 74, PLI's \$969 PLI CD-ROM MS and Procom Technology Inc.'s \$795 Mac-CD-MX. We also tested a preproduction model of Chinon America Inc.'s CDA-535, but a final unit did not make it in time to be included in this review (see story above).

The drives reviewed represent three different mechanisms. Apple uses a Sony mechanism; MacProd-

ucts, PLI and Procom use a Toshiba mechanism; and NEC uses a proprietary mechanism. Each company uses different driver software. These five units do not represent the only double-speed drives on the market. For instance, many vendors offer drives that use the same Toshiba mechanism and drivers as those reviewed here. We chose a representative sampling of vendors for our review (see story below). In addition, Apple and other companies offer internal versions for the Quadras and other Macintoshes with internal drive bays.

Rating performance. We tested the units with a range of applications that typify popular uses of these drives (see bench-

marks, Page 56). These tests included the opening of individual and multiple files on a CD as well as QuickTime playback. To provide some measure of comparison, we also tested a single-spin drive, the PortaDrive from CD Technology Inc., a good performer from the previous generation of CD-ROM drives (see MacWEEK, Jan. 27, 1992).

All the drives offer multisession support for discs created in Eastman Kodak Co.'s Photo CD for-

mat, and our performance benchmarks included tests that used this format.

The double-speed drives generally outdistanced the single-speed PortaDrive; on most occasions their performance nearly doubled that of the PortaDrive. The Apple, prerelease Chinon and PLI drives performed particularly well in all tests — most of the time only fractions of a second separated them. The performance of the

See CD-ROMs, Page 56

Prerelease Chinon looks good

We looked at a preproduction version of Chinon America Inc.'s CDA-535 but were unable to get a shipping version before the main review went to press. A Chinon representative told us that the proprietary mechanism used by the company was final, so we tested the unit along with the other five double-speed CD-ROM drives.

In our benchmark tests, the \$745 CDA-535 performed very well — nearly as well as Apple's entry, the AppleCD 300.

The Chinon is noteworthy because it has the smallest footprint of all the drives, thanks to its use of an external power supply. It doesn't come bundled with any CD-ROMs.

The CDA-535 should ship in mid-June. Based on our look at it, we think it will be strong competition for the Apple drive, if Chinon can keep the street price low.

Chinon America Inc. is at 615 Hawaii Ave., Torrance, Calif. 90503. Phone (310) 533-0274; fax (310) 533-1727. — By Philip Bishop

score card

Double-speed CD-ROM drives

As the CD-ROM market continues to build up steam, drive manufacturers are moving to address one of the major shortcomings of the technology: its slow speed. One way they have found to speed up things is to spin the disc faster and provide a decoding mechanism to cope with the increased flow of data. We tested five of these double-speed drives — representing three mechanisms — to see if they lived up to their promise.

► **AppleCD 300** from Apple is the best of this new breed. The only unit we tested with a Sony mechanism, the AppleCD 300 performed very well in all tests. Its construction is solid, its documentation was the best of all we looked at, and the nine CDs bundled with it are top-notch. To clinch the matter, the AppleCD 300 is also one of the best-priced double-speed drives, although Apple does not include cables with the drive.

► **Magic CD-ROM Drive 3401** from MacProducts USA uses the Toshiba mechanism. It is a good performer at a good price. But while its price is attractive, it has no RCA jacks for hooking up speakers, and you have to close its drive door manually. For \$50 more, you can get a set of six CDs with the Magic CD-ROM, although they are not at the level of the Apple set.

► **MultiSpin 74** from NEC Technologies Inc. uses a proprietary mechanism, but its performance was surprisingly lackluster. This is disappointing because the MultiSpin 74 is one of the most thoughtfully designed drives of those we tested — it's the only drive, for example, with a power switch on the front of the unit. It has no bundled CD-ROMs, but it is attractively priced and comes with a two-year warranty.

► **PLI CD-ROM MS** from PLI uses the Toshiba mechanism, but it ships with a driver from Trantor Corp. that makes the unit a stellar performer. It is saddled with the highest list price of the group, although its street price is about \$750. The documentation lacks illustrations, and termination is not clearly explained. It also comes with no bundled CD-ROMs.

► **Mac-CD-MX** from Procom Technology Inc. is the final Toshiba-based drive, but its driver software made it the worst performer of the group. An upcoming version of the driver should put it in the same class as the PLI and MacProducts units, but the Mac-CD-MX has little to distinguish it from the competition. It has a single door that you have to manually close and comes with no bundled CD-ROMs.

Why not every double-speed drive?

The Toshiba mechanism found in three of the CD-ROM drives we tested is also used by many storage vendors, including FWB Inc., MicroNet Technology Inc., APS Technologies and Mass Microsystems Inc. It is also widely available from a number of mail-order and direct-sales vendors, sometimes under those vendors' brand names.

For logistical considerations, we didn't test all the available drives, and for that reason we can't rate all these other models. However, it is reasonable to expect similar performance characteristics from different models that use the same Toshiba mechanism and driver software as the ones tested here.

If you decide you want a Toshiba-based CD-ROM drive, you should check to see which driver software a company sells with the unit, as well as whether the company includes additional items, such as bundled CDs, cables and so on.

	AppleCD 300	Magic CD-ROM Drive 3401	MultiSpin 74	PLI CD-ROM MS	Mac-CD-MX
Overall value	◆◆◆◆	◆◆◆◆	◆◆◆◆	◆◆◆◆	◆◆
Price	\$599	\$599	\$615	\$969	\$795
Performance	◆◆◆◆	◆◆◆◆	◆◆	◆◆◆◆	◆◆
Features	◆◆◆◆	◆◆◆◆	◆◆◆◆	◆◆◆◆	◆◆
Compatibility	◆◆◆◆	◆◆◆◆	◆◆◆◆	◆◆◆◆	◆◆◆◆
Configuration	◆◆◆◆	◆◆◆◆	◆◆◆◆	◆◆◆◆	◆◆◆◆
Documentation/support	◆◆◆◆	◆◆◆◆	◆◆◆◆	◆◆	◆◆

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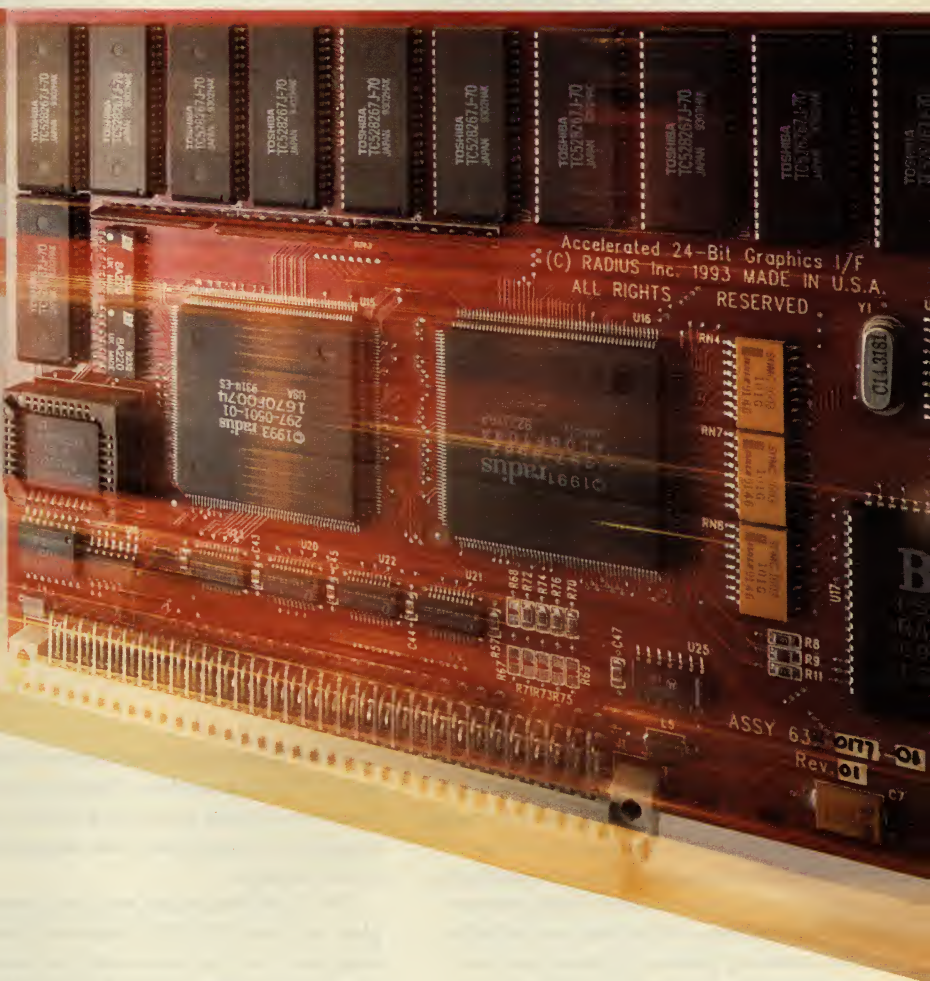
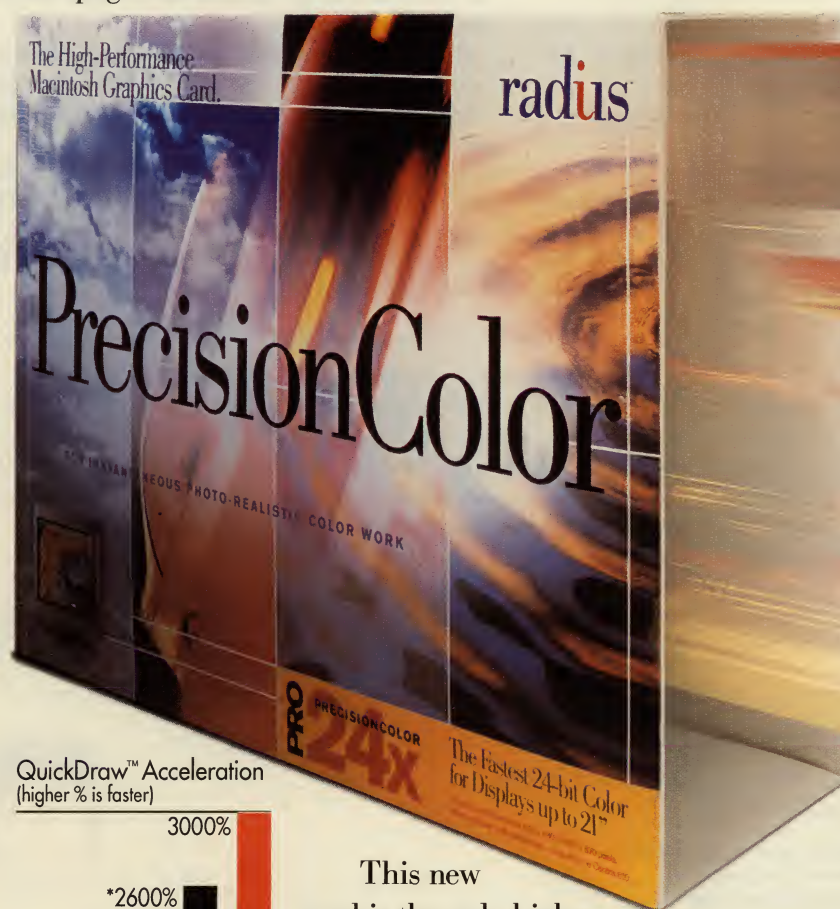
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CD-ROMs

From Page 54

MacProducts drive wasn't far behind these front-runners.

The NEC and Procom drives were less stellar in their performances. Because NEC was one of the first to market with this new double-speed technology, we had expected more fireworks from its entrant, yet the MultiSpin 74 placed consistently in the middle of the pack.

Performance is certainly the primary consideration when evaluating a drive's overall value, but there are other factors to consider.

Procom problems. The performance of the Procom drive was puzzling to us because it uses the same Toshiba mechanism as the MacProducts and PLI units. The culprit appears to be the unit's driver software, which is the standard driver licensed by Toshiba (developed by Optical Media International) for use with the mechanism. PLI opted to use another source — Trantor Corp. — for its driver, which paid off handsomely. MacProducts originally shipped the lackluster OMI 1.5.2 driver with its unit, and our

results with that driver were comparable to those of the Procom. MacProducts subsequently changed to the Anubis driver developed by CharisMac Engineering Inc., which offers much-improved performance.

For our tests, we used Version 1.5.2 of the Toshiba software, which shipped with our unit. Ziff-Davis Labs in Foster City, Calif., has been testing a beta of Version 1.6 of OMI's software with the Toshiba mechanism and found greatly improved performance. We do not have any word on when a final version should be available, but Procom told us it will offer it as soon as it is available.

Performance can also be improved in some instances by using CD-ROM driver software from a third party, such as FWB Inc.'s CD-ROM Toolkit (see story, Page 58) or ShirtPocket Software Inc.'s SpeedyCD (see MacWEEK, Jan. 27, 1992).

More than speed. Performance is certainly the primary consideration when evaluating a drive's overall value, but there are other factors to consider, including additional features, hardware design, documentation and ease of setup. When taking these items into account, the NEC drive, for example, seems a lot more attractive than it did in the test lab.

The NEC MultiSpin 74 is the most thoughtfully designed of all the drives; it is the only drive with a power switch on the front of the unit and the only drive with switch-

Waiting in the wings: CD-ROM XA

You probably had no doubts that the quick double-speed drive you were about to purchase would eventually be superseded by even niftier CD-ROM technology. But you probably wouldn't have guessed that the next wave would be crashing ashore before year-end.

The new wave is called CD-ROM XA, with XA standing for "extended architecture." Developed in 1989 by Sony Corp., Philips Consumer Electronics Co. and Microsoft Corp., XA is an emerging CD-ROM format tailor-made for the growing number of multimedia CD-ROM titles.

"It's changing the paradigm for multimedia publishing," said Tom Lopez, co-founder and co-chairman of Mammoth Micro Productions of Seattle. "All CD-ROM drives will be XA drives within a year." Lopez's company, which creates and markets interactive multimedia products and production services, has been at the vanguard of XA implementation.

A report on the XA format produced by Mammoth outlines three key benefits the new standard is expected to bring:

- ▶ Multimedia presentations with seamless interactivity, tightly synchronized video and audio, and multiple channels of high-quality audio.
- ▶ An expanded range of possible multimedia CD-ROM titles.
- ▶ Cross-platform compatibility.

With existing CD-ROM formats, different data types, such as video, audio, graphics and text, must reside in different files, forcing the drive to seek data in multiple disc locations. The constant switching among different

files results in delays during playback and slows the speed at which you can interact with the disc. This is frustrating for the user and limiting for the developer, although products such as QuickTime, designed with existing CD-ROM technology in mind, minimize this skipping around.

Proponents of CD-ROM XA claim the new format will solve the problems of CD-ROM using a technology known as interleaving, which allows video, audio, graphics and text to be combined together into a single file. Data from a disc is not read into RAM in its entirety nor does it require large hard disk caches. Rather, through a process called streaming, a decoder within an XA-compatible CD-ROM drive routes audio to speakers and routes video, graphics and text data to the screen as a tightly synchronized and smoothly flowing whole. In this ideal scenario, you should be able to play XA CD-ROMs even on low-performance machines. Right now the only XA-compatible drives on the market reside in IBM Corp.'s Ultimedia system and Sony's Multimedia Compact Disc line, although XA titles should eventually work on all platforms.

According to Lopez, the XA technology is backward-compatible, meaning that all titles, no matter when they were created, should be able to benefit from the performance increase offered by the new format.

Eastman Kodak Co.'s early adoption of XA as the format of choice for its Photo CD technology is expected to speed acceptance of CD-ROM XA and hasten its likely appearance in the next generation of Macintosh CD-ROM drives. — By Philip Bishop

able termination. It's also one of only three of the drives that provides a way to manually eject a CD when the power is off (the Chinon and Apple drives also offer this feature). In addition, the NEC has the best warranty of the group tested: two years.

In addition to its high level of performance, the AppleCD 300

comes bundled with a noteworthy collection of nine CDs that provide a lively and rich introduction to Mac CD-ROM titles. For some perverse reason, however, the drive doesn't come with any cables, so you have to add the price of these to your overall cost. We were also troubled by the AppleCD 300's long length

and short width, which made it difficult to stack the drive on top of (or beneath) other SCSI drives. In its favor, the AppleCD 300 has double doors that help keep out troublesome dust particles.

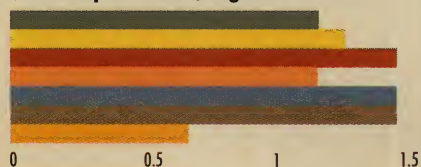
MacProducts' Magic CD-ROM Drive also comes with CD-ROM titles, but of a lesser quality

See CD-ROMs, Page 58

Test-driving the CD-ROMs

Shown here are the results of four tests used to gauge overall CD-ROM drive performance. The group search and retrieve test used Broderbund Software Inc.'s Just Grandma & Me CD-ROM, an interactive multimedia representation of the popular children's book by Mercer Mayer. Each page in the book is an individual file containing graphics, digitized sound and various animation elements. In this test, we timed the loading of each page. This provides information on how the drives performed when executing many read requests for small blocks of data, with CPU activity taking place between read requests.

The data stream test used Adobe Photoshop to load a 12.5-Mbyte color TIFF file from a test

Sound and video test
(frames per second; higher is better)

CD-ROM. This gives an excellent representative test of CD-ROM throughput. Photoshop loads files in small blocks, producing a test that is less dependent on caching and more dependent on raw throughput.

With QuickTime movies becoming commonplace as a part of CD-ROM content and considering that its storage requirements are tremendous, a test involving playback of QuickTime movies from CD was an obvious choice. This sound and video test (below, left) used Apple's Movie Player and QuickTime to give us a performance index in frames per second of actual playback.

Finally, since all the double-speed drives we tested were multisession-compatible with Eastman Kodak Co.'s Photo CD format, we tested how fast they could open a contact sheet from a CD-ROM. A multisession drive is one that can read data (in this case, photographs) appended to a disc in a separate "session."

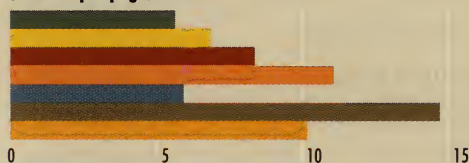
We used the single-speed PortaDrive from CD Technology Inc. to give us a baseline to compare the double-speed results with the previous generation of CD-ROM drives.

— By Philip Bishop

BENCHMARKS

Double-speed CD-ROM drives

(Lower is better)

Group search and retrieve test
(seconds per page)Multisession Photo CD test
(seconds)Data stream test
(minutes)

Tests were performed on a Quadra 900 running System 7.1 and on-board video with an Apple 13-inch color monitor, 8 Mbytes of RAM and a 30-Mbyte partition on a 160-Mbyte hard disk. Virtual memory and AppleTalk were turned off and 32-bit addressing was on. For software we used Adobe Photoshop 2.0.1, Movie Player 2, Eastman Kodak Co.'s PCDView 0.3.10, Broderbund Software Inc.'s Just Grandma & Me and The New Grolier's Electronic Encyclopedia 3.0.3.

*CDA-535 tested was a prerelease unit.

**PortaDrive is a single-spin CD-ROM drive; it cannot read multisession Photo CDs.



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CD-ROMs

From Page 56

than Apple's offering. You will have to pay an extra \$50 for the set of six, however. The Magic CD-ROM Drive is the only one of the six CD-ROMs we tested that did not include RCA jacks for hooking up external speakers.

The documentation for all the drives is generally satisfactory. As might be expected, Apple has the best documentation of the group. PLI's manual lacks illustrations, and termination is not clearly explained, which put it below the mean.

None of the units presented us with any setup problems — a pleasant surprise and a far cry from the early days of CD-ROM drives. Compatibility with existing CDs,

which had been a specter hanging over the head of double-spin technology, was not a problem in our tests.

Conclusions. Double-speed CD-ROM drives definitely offer better performance and easier setup than their slower ancestors. Of the three mechanisms we tested, the Toshiba and the Sony offer the best performance, although the speed of the prerelease Chinon mechanism was comparable. If you are looking for the fastest double-speed drive, these are the mechanisms to start with.

Of the Toshiba-based drives we tested, the PLI CD-ROM MS was the fastest, thanks to its driver. The PLI offering is saddled with the highest list price, although it can be found on the street for about \$750.

MacProducts USA's Magic CD-ROM Drive 3401 has a better price than the PLI CD-ROM MS, although it wasn't as impressive a performer.

We can find little that makes Procom's Mac-CD-MX stand out from the crowd, however. Its performance suffers from the slow driver software, although this should be fixed soon enough that the Mac-CD-MX will perform comparably to the other drives that use the Toshiba mechanism.

NEC's MultiSpin 74, which uses a proprietary mechanism, is not the fastest double-

speed drive, but its design and low price make it attractive. NEC also offers a number of other MultiSpin models, including a portable unit, which might make sense for many users.

The AppleCD 300, however, is the pick of the crop. In another example of Apple's determination to continue its aggressive pricing policy, the AppleCD 300 is not only one of the best-constructed and fastest of the drives we tested, it's also one of the cheapest. That combination is hard to beat. □

Product Info

APPLE

AppleCD 300: \$599

20525 Mariani Ave., Cupertino, Calif. 95014
Phone (408) 996-1010

MACPRODUCTS USA

Magic CD-ROM Drive 3401: \$599 (\$649 with six-CD bundle)

608 W. 22nd St., Austin, Texas 78705
Phone (512) 472-8881; fax (512) 499-0888

NEC TECHNOLOGIES INC.

MultiSpin 74: \$615

1255 Michael Drive, Wood Dale, Ill. 60191
Phone (708) 860-9500 or (800) 388-8888;
fax (800) 366-0476

PLI

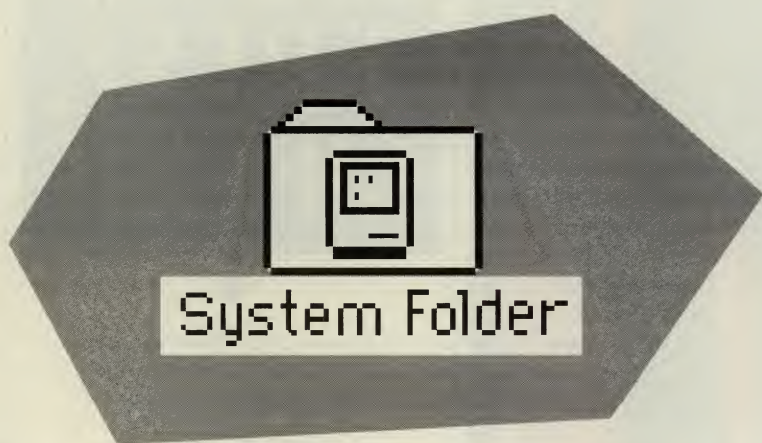
PLI CD-ROM MS: \$969

47421 Bayside Parkway, Fremont, Calif. 94538
Phone (510) 657-2211;
fax (510) 651-5948

PROCOM TECHNOLOGY INC.

Mac-CD-MX: \$795

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FWB speeds up CD-ROM drives

If your double-speed or regular-spin CD-ROM drive isn't spinning as fast as you'd like, CD-ROM ToolKit, a \$79 utility from FWB Inc., may be able to get you up to speed.

CD-ROM ToolKit attempts to alleviate speed problems by providing what FWB calls an efficient device driver that supports most popular CD-ROM drives and data formats. Second, CD-ROM ToolKit creates a mirror on your hard disk of the directory information on the CD-ROM, which can make for much faster data-access times.

To use CD-ROM ToolKit, you must remove all software that may have been installed with your CD-ROM drive and install the software that comes with the FWB product. This software includes familiar CD-ROM utilities, such as Foreign File Access, ISO 9660 File Access, Audio CD Access, High Sierra File Access and Apple Photo Access, plus CD-ROM ToolKit itself, which is a control panel. Also included is CDT Remote Desk Accessory, which lets you play audio CDs through your CD-ROM drive.

By checking a box in the control panel, CD-ROM ToolKit will automatically build a cache file when you insert a CD-ROM. Alternatively, you can have the control panel prompt you each time you insert a disc.

CD-ROM ToolKit's Acceleration Options let you set the read-ahead caching options. Read-ahead caching (sometimes referred to as prefetching) is designed to anticipate the next request for data from the CD-ROM drive by reading information physically adjacent to the previous request. You can set the read-ahead cache to either 2- or 32-Kbyte data blocks, and you can disable this function entirely, if you want.

We had mixed results using CD-ROM ToolKit. For our group search-and-retrieve test, we used Broderbund Software Inc.'s Just Grandma & Me, an interactive multimedia CD-ROM. Each page of the book is saved as an individual file, each containing graphics, digitized sound and various animation elements. The loading of each page was timed to provide data on how the drives performed when executing many read requests for small blocks of data, with CPU activity taking place between read requests. This would seem to be a classic scenario in which CD-ROM ToolKit could strut its stuff.

Using a Mac-CD-MX double-spin drive from Procom Technology Inc., CD-ROM ToolKit did indeed strut. While the native software provided with the Procom drive averaged a painfully slow 14.6 seconds per page, the CD ToolKit performance was a very respectable 6.9 sec-

onds per page, coming in a bit slower than the AppleCD 300 using Apple's native driver (which came in at 5.6 seconds per page).

In this test, we couldn't speed up the Apple drive, however. The best we could achieve using CD-ROM ToolKit on the AppleCD 300 was 6.2 seconds per page. FWB surmised that the on-board caching system employed by Apple in its driver software may have nullified any performance increase that CD-ROM ToolKit might have provided.

A single-spin drive we tested, CD Technology Inc.'s PortaDrive, showed only modest improvement when its native driver was replaced with the CD-ROM ToolKit. With the CD Technology driver, it took an average of 10.1 seconds to turn a Grandma & Me page, while the FWB driver improved this to 9.2 seconds.

We got similar results in another test, in which we timed how long it took three drives to open a 12.5-Mbyte color TIFF file in Adobe Photoshop: The PortaDrive opened it 20 seconds faster with CD-ROM ToolKit — three minutes, one second vs. three minutes, 21 seconds without the utility. The Procom drive showed the most improvement — from one minute, 55 seconds with its native driver to one minute, 13 seconds with CD-ROM ToolKit; this brought it in line with the fastest drives we tested. One of these, the PLI CD-ROM MS, ran at about the same speed (one minute, 12 seconds) with and without the FWB software.

Clearly, CD-ROM ToolKit is not for everyone. It's safe to say, however, that nearly all single-spin drives and many slower double-speed drives can get a shot in the arm from the FWB software. It is also more full-featured than the standard driver software offered by many CD-ROM vendors, which is another plus.

CD-ROM ToolKit works with any Macintosh from a Plus on up. The caching feature requires 1 to 3 Mbytes of hard disk space. The list of drives supported by CD-ROM ToolKit is impressive and covers most popular drives. FWB said it will update the drives it supports as soon it can test them.

Another product, ShirtPocket Software Inc.'s SpeedyCD, can also help improve the performance of many popular CD-ROM drives (see MacWEEK, Jan. 27, 1992), although CD-ROM ToolKit has a number of features not found in SpeedyCD.

FWB Inc. is at 2040 Polk St., Suite 215, San Francisco, Calif. 94109. Phone (415) 474-8055; fax (415) 775-2125.

— By Philip Bishop

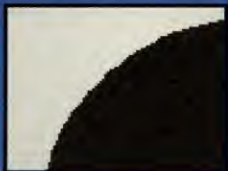
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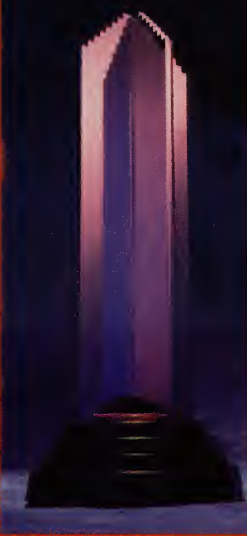


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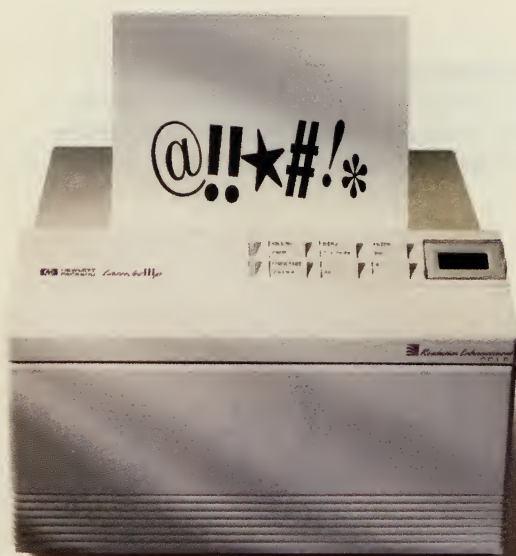
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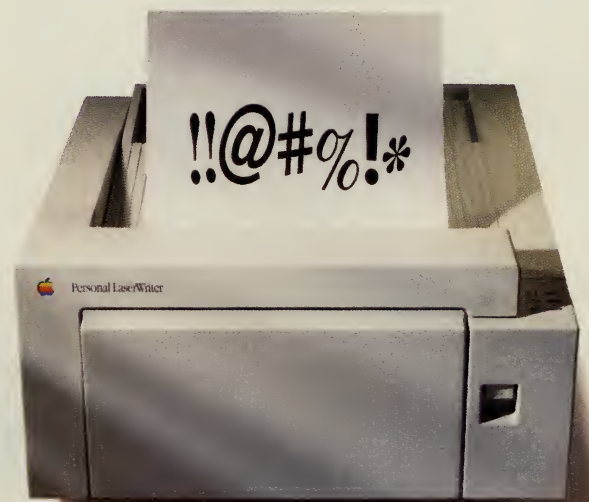
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Add-on cards help bring low-end LC up to speed

Users have an array of choices when upgrading Apple's single-slot LC models.

By Mitzi Waltz

Apple's LC line was never envisioned as a set of screaming-fast powerhouse machines. Instead, Apple saw them as reincarnations of the best-selling Apple II: low-end color machines for education and the occasional small-business user. Imagine the manufacturer's surprise when it found the LC gaining wide acceptance in business. According to the most recent MacWEEK 200 survey, 67 percent of the largest Mac-using corporations have LCs, with an average of 108 machines installed (see MacWEEK, May 24).

Once hooked on these entry-level color Macs, however, business users must deal with their built-in limitations. The original LC featured a 16-MHz 68020 processor, its LC II successor had a 16-MHz 68030 processor, and the new LC III has migrated to a 25-MHz 68030. The first two had 16-bit data paths, while the LC III features the same 32-bit data bus found on faster Macs.

Most base models came with too little RAM for complex graphics or desktop publishing (4 Mbytes was the standard LC II RAM configuration) and were incapable of running QuickTime movies at an adequate speed.

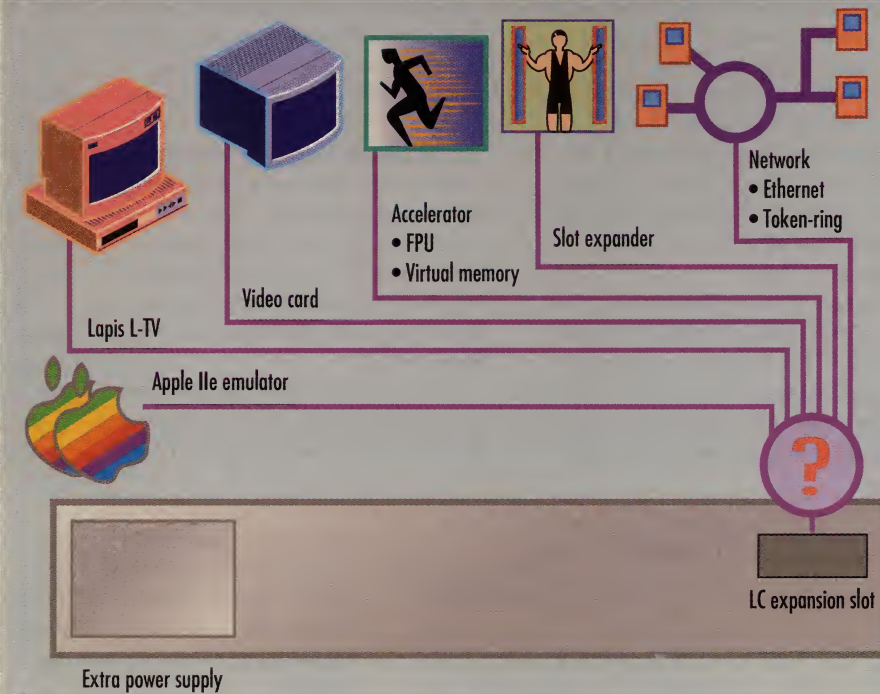
At Monsanto Co. of St. Louis, for example, LC and LC II machines in the lab and on scien-

tists' desks have been beefed up with extra RAM, and some may receive Ethernet boards, said Mark Williams, user-support group leader. "If we need [68040] capabilities, we would probably buy a new machine," he said.

But jumping ship to the least expensive '040-based Centris, for example, will cost \$1,375, not including extra RAM, video card and monitor. That makes the upgrade path a natural for many LC buyers. In response, vendors have come out with extra video-RAM modules to boost the LC's color capabilities to 24 bits; low-cost RAM; and a variety of expansion boards designed for the LC's single processor direct slot. Almost all these products are also applicable to the LC's mass-market counterparts, the Mac Performas.

Dual strategies. A few savvy vendors have even found ways to get around that single-slot limitation: The TwinSlot LC from Sonnet Technologies Inc. is an expansion kit for LC and LC II machines that includes a two-slot adapter card that works in combination with the PowerCache accelerator board from DayStar Digital Inc. The adapter comes with an I/O card that can add either big-screen video or Ethernet

The LC upgrade dilemma: Many choices, one slot



NEVIN BERGER

capability. In addition, the TwinSlot LC surmounts the other major obstacle to upgrading the LC—its small, 25-watt power supply—by adding a 50-watt power supply plus an expanded-chassis top to hold all these new goodies.

"It works—that's the most important thing," said Frank Breitman, a Philadelphia lawyer who recently installed the TwinSlot on his LC. "I had already put in 10 Mbytes of RAM and more VRAM in my LC, but with only one PDS slot, I wasn't sure where to go next."

Breitman didn't want to buy a \$600 board to upgrade to an LC III because the two models use different SIMMs, and he would have lost

his investment in RAM and acceleration. "I didn't want to just junk it," he said. "I've been really happy with what the LC can do."

His Sonnet two-card adapter now holds an accelerator card and a VideoSpigot Mac LC frame-grabber board from SuperMac Technology Inc. of Sunnyvale, Calif. "LC boards are plug-ins, so it's not that hard to install," Breitman said.

But finding expansion happiness was not automatic, Breitman cautioned. He ordered a multifeature board from one manufacturer that later admitted that it was unable to manufacture the advertised item.

More multipurpose methods.

DayStar's Universal PowerCache card is an accelerator board that provides LC owners with 33-, 40- or 50-MHz '030 performance for \$449 to \$999. R.B. Wynn, who handles database work for St. Charles, Ill.-based AutoCloser Corp., said the 40-MHz card, which he purchased with the optional PMMU (paged memory management unit) installed, has given him enough power to manipulate large Microsoft FoxBASE files.

"We needed more and more speed, and the card [increased] it considerably," Wynn said. "I started out by getting a bigger hard drive, then more memory, then bought [DayStar's] Equalizer LC to get virtual memory. This accelerator board did what they said it would do."

The PowerCache requires the PowerCache Adapter LC, a PDS-

See LC extras, next page

LC architecture creates obstacles for developers

For Jim Hamilton, software design engineer for Technology Works Inc., creating boards for the Mac LC series has been a major challenge. It's as if Apple had conspired to make things difficult for the aspiring developer.

"The biggest drawback to the LC is that the power supply is not all that powerful," Hamilton said. Processor direct slot boards can't consume more than 4 watts, and since Technology Works' 68040 accelerator uses 3 watts, other board components, such as math coprocessors or connectivity options, must make do with the leftover watt. "Making it work is possible, obviously—we've done it," he said. "But it wasn't easy."

Differences between the models are more significant than the addition of "II" and "III" after the "LC" might indicate, he added. For

example, the LC II uses a 68020 coprocessor and the LC III uses an 68030. Consequently, the memory systems on the two are similar, but not the same.

The LC II and III support virtual memory, a feature that lets programs use extra hard drive space as if it were RAM. However, the Ethernet controller on Technology Works' Ethernet board is a "bus-master" device that at intervals takes control of the system and reads the memory directly. If the software in use doesn't "tell" the card that virtual memory is in use, it will miss some of the data, which can crash the system.

Surprisingly, Hamilton sees the LC's single-slot design as more of an "opportunity" than a drawback, a feature that makes it possible and desirable to put multiple functions, such as Ethernet capability and a math coprocessor, on a single card.

The LC's popularity alone makes designing boards for it so worthwhile, Hamilton said. "The biggest advantage [to the LC] is that Apple sells an awful lot of them," he said. "There are a lot of empty slots to be filled."

There is also the advantage of the matching mass-marketed Performa. According to Hamilton, almost anything developed for an LC will work in the corresponding Performa, and vice versa, providing even more opportunities for profits.

The LC III presents a few special problems, Hamilton said. "It has a wider data bus than the LC or LC II, although it has pretty much the same slot," he said. "Apple had to do tricks in that slot interface to get it to work correctly, but there are some quirks."

According to Hamilton, finding work-arounds for those quirks is the main reason that few LC III-specific cards have found their way to market. — By Mitzi Waltz

Video cards maximize LC display capability

Lapis Technologies Inc., best-known for its inexpensive Macintosh display solutions, has developed several add-ons for the LC.

The company's ProColorServer video cards add support for eight-, 16- or 24-bit color on monitors as large as 21 inches, depending on the model purchased. All include video-RAM chips and are optimized for use with the LC's small power supply. In keeping with the trend of multi-use LC boards, all four processor direct slot cards also feature a socket for an FPU (floating-point unit) math coprocessor chip.

The boards are available for the LC, LC II and LC III, said Lapis spokesman David Glickman. "On the III we've had quite a few people buying it primarily so they can create or run 16-bit QuickTime movies," he said. QuickTime is optimized for 16-bit

color, and Kodak Photo CD images also display well at that bit level. He said that LC and LC II owners tend to purchase the cards as a way to upgrade color quality and add a larger monitor.

Lapis also offers DisplayNet LC, a dual-function board that combines Ethernet support with monochrome video, and DisplayServer LC, a one-bit, multi-resolution video board.

In addition to Lapis, several companies sell cards that adapt the LC for use with large-screen monitors (as large as 21 inches) including Sunnyvale, Calif.-based SuperMac Technology Inc.; Envisio of St. Paul, Minn.; RasterOps Corp. of Santa Clara, Calif.; and NEC Technologies Inc. of Wood Dale, Ill.

Lapis' L-TV and L-TV Pro are cards that let users output NTSC video directly from the Mac to a TV monitor or VCR. L-TV Pro

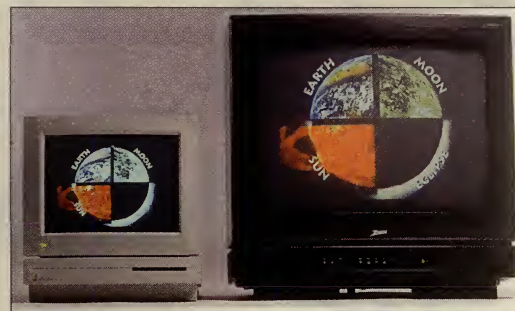
adds support for the S-video standard.

Jan Long, technical coordinator for Covington City Schools in Covington, Tenn., said she is thrilled that the L-TV allows her to output presentations to videotape or use TV monitors as display devices.

"We've used L-TV with an LC II hooked to a RCA TV monitor to run the Grolier Encyclopedia CD-ROM in our library," she said. At other times, the LC is checked out of the school's library and taken into classrooms, she said, where it can be used with schoolroom TV monitors.

The school also uses the L-TV card to project interactive CD-ROM books, such as Broderbund Software Inc.'s "Just Grandma and Me," on a large-screen television.

Long said the L-TV board offers good-quality video results for a reasonable



Lapis' L-TV card lets users output NTSC video directly from an LC to a television or VCR.

price, especially when compared with an \$800 board she tried previously.

Long said she prefers to use an active-matrix wall-screen display when making Aldus Persuasion presentations to parents or the school board, but other users have found the L-TV cards handy for making presentations, especially on the road.

— By Mitzi Waltz

LC extras

From previous page

to-NuBus adapter, also available from DayStar.

The Equalizer LC is an '030 upgrade for the original LC that provides a socket for an optional PMMU, which lets you use virtual memory.

Speed demons. Users can expect speed increases of several hundred percent with Technology Works Inc.'s LC 040 Accelerator for the LC and LC II, both of which include a 25-MHz '040 chip and an on-board FPU (floating-point unit).

The company also offers a VRAM module with an optional FPU and an external Ethernet SCSI adapter box that allows users to connect Ethernet cards to the LC and LC II SCSI ports.

Applied Engineering's Trans-Warp 4300 series adds an '030 CPU [at speeds of 25, 33 or 40 MHz], plus a 128-Kbyte static-RAM cache inside the LC or LC II. The first two speeds will allow use of virtual memory, and each includes an upgrade path and a three-year warranty. An optional 68882 math chip is also available. In addition, Applied Engineering offers the FastMath 16-MHz 68882 FPU; FastMath LC III, a 25-MHz 68882 FPU chip; and the LC Power Supply to help run these power-hungry add-ons.

For users who want Apple IIe emulation, Applied Engineering sells its 5.25 drive, which is configured for use with Apple's IIe emulation card.

Extreme Systems' Impact 33-MHz '030 upgrade board for the LC and LC II is available with or without an FPU. Mark Zolenas of Bethlehem Steel Corp. of Baltimore, who uses his LC to run

processing-intensive astronomy programs, said the Impact board made a world of difference. "There was an overall speed improvement, including scrolling and opening," he said.

Fusion Data Systems also sells its TokaMac series of '040 accelerators for the LC and LC II.

Thanks for the memory. Of course, RAM chips and VRAM modules for the LC are available from scores of vendors.

Asanté Technologies Inc. has focused on adding Ethernet capabilities to the LC, although some of its Ethernet cards also include slots for an optional PMMU. The

company recently announced a new line of lower-cost Ethernet boards under the AsantéLite label. Its original line, the Mac-Con+ boards, now are bundled with SNMP (Simple Network Management Protocol) agent software that works with intelligent 10BASE T Ethernet hubs to give managers access to desktop-level network information, said Asanté spokesman Chris Inman. These products are available for all three LC models.

For users whose PDS slot is full, Asanté also offers an external Ethernet SCSI adapter box.

Dayna Communications Inc. of Salt Lake City sells a compet-

ing card, the ELC, which also includes SNMP support for network management.

LC III or bust. Most people buy cards to upgrade obsolete equipment, so LC III add-ons are relatively rare. Apple answered most user requests in the new machine's design by providing faster data throughput and a speedier motherboard. It also made substantial changes to the slot design, effectively forcing developers to start from scratch (see story below). LC III-specific add-on cards include the 25-MHz FPU from Logica Research Inc., plus Ethernet boards from Asanté, Dayna and Technology Works. □

Case Study

Accelerating the LC presents trade-offs in features, cost

Balancing a tight budget with the need for more power, a high school official finds the best solution.

By Mitzi Waltz

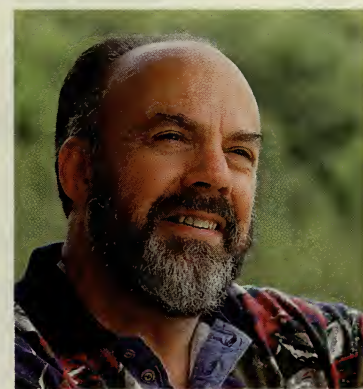
At Notre Dame High School, a parochial school in Chattanooga, Tenn., the LC is the Mac of choice for both students and staff.

Cost is more of a concern than overall performance, said Business Manager Steve Kesler. While color is essential for much educational software and spreadsheets, it doesn't matter that the machine is a bit slow to students in the computer lab — they are learning word processing and other basic computer skills.

In Kesler's office, however, speed is important. He has to track the school's finances; create presentations; and work with large, complex Microsoft Word

documents. He has filled the RAM slots to his LC's 10-Mbyte limit and has gone through a series of accelerator boards in search of more processing speed.

Kesler's final choice was DayStar Digital Inc.'s Power-Cache, a board that adds a 50-MHz Motorola 68030 CPU, a 32-Kbyte static-RAM cache and a math coprocessor to the LC's single processor direct slot. Versions of the 33-MHz and 40-MHz cards are also available. Kesler based his decision to switch on both published test results that showed the PowerCache was faster than competing boards and on the less-than-stellar performance of another ven-



ROB NELSON/BLACK STAR

Steve Kesler, business manager of Notre Dame High School in Chattanooga, Tenn., tried numerous LC accelerator boards in his quest for more processing speed.

dor's card he had tried previously.

With his new card in place, Kesler said, his LC is faster than an LC III. "Overall, I get quicker displays of menus, and it speeds up the booting process," he said. Previously, scrolling and executing commands in Excel, Word and other programs was slow.

While Apple and other manufac-

See Case study, Page 66

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Case study

From Page 64

turers offer a 68040-based card that will upgrade an LC II to an LC III, Kesler opted for the PowerCache because he wanted to retain his RAM investment (the LC II and LC III use different SIMMs). Being limited to 10 Mbytes of RAM could be a significant drawback for some users who are considering upgrades, but Kesler said he has encountered no problems. Since he does not use the

machine for graphics or desktop publishing, he said, his RAM configuration should be adequate for some time.

Unfortunately for Kesler, adding the Day-Star board meant removing his Ethernet/math coprocessor card from Asanté Technologies Inc. and dropping back to AppleTalk network speeds.

Kesler has additional upgrade plans, the execution of which will depend on available funding. He has already added a 200-Mbyte

external hard drive and would like to increase the size of his 80-Mbyte internal drive to match. He also wants his Ethernet back. "A couple of companies make expansion chassis for the LC," he said.

Kesler said his regular mail-order vendor did not recommend future upgrades without swapping his machine's "tiny" power supply for a larger model. "The advantage of the expansion-chassis concept is that it comes with a more robust power supply," he said. □

Product Info

APPLIED ENGINEERING, A DIVISION OF AE RESEARCH CORP.

FastMath LC (16-MHz FPU): \$117; **FastMath LC III (25-MHz FPU):** \$109; **TransWarp 4325 (25-MHz):** \$349, \$458 with FPU; **TransWarp 4333v (with virtual memory):** \$449, \$563 with virtual memory and FPU; **TransWarp 4340 (40-MHz):** \$449, \$598 with FPU; **LC Power Supply:** \$102; **5.25-inch drive (for Apple IIe Emulation Card):** \$192
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Phone (214) 241-6060 or (800) 554-6227;
fax (214) 484-1365

ASANTÉ TECHNOLOGIES INC.

AsantéLite Ethernet board: \$189; **MacCon+ Ethernet board:** \$229; **Asanté EN/SC SCSI adapter:** \$459 (AU/thin/10BASE T); **Mini-EN/SC SCSI adapter:** \$399 (10BASE T) or \$459 (thin/10BASE T)
821 Fox Lane, San Jose, Calif. 95131
Phone (408) 435-8388 or (800) 662-9686;
fax (408) 432-7511

DAYSTAR DIGITAL INC.

PowerCache: \$449 to \$999; **NuBus adapter:** \$49; **PowerMath LC:** \$129; **Equalizer LC:** \$199 to \$279
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Phone (404) 967-2077 or (800) 942-2077;
fax (404) 967-3018

EXTREME SYSTEMS

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fax (206) 575-3928

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TokaMac ELC: \$795; **TokaMac LC 25i:** \$895; **TokaMac LC 25:** \$1,095
8920 Business Park Drive, Suite 350, Austin, Texas 78759
Phone (512) 338-5326 or (800) 865-2622;
fax (512) 794-9997

LAPIS TECHNOLOGIES INC.

L-TV Television Interface Card: \$349; **L-TV Pro Television Interface Card:** \$499; **ProColorServer 8 LC:** \$399; **ProColorServer 8•16 LC:** \$499; **ProColorServer 24 LC:** \$599; **ProColorServer 24x LC:** \$699; **DisplayNet LC:** \$549; **DisplayServer LC:** \$349
1100 Marina Village Parkway, Suite 100, Alameda, Calif. 94501
Phone (510) 748-1600; fax (510) 748-1645

LOGICA RESEARCH INC.

LogiCache Accelerator: \$749; **LC adapters for all models:** \$59
2540 Brockton Drive, Suite 110, Austin, Texas 78758
Phone (512) 836-2168 or (800) 880-0988;
fax (512) 832-1533

SONNET TECHNOLOGIES INC.

TwinSlot LC: \$349; **CPC-LC16 (16-MHz math coprocessor):** \$49; **FPU-PLC25 (math chip for LC III):** \$55
18004 Skypark Circle, Suite 260, Irvine, Calif. 92714
Phone (714) 261-2800 or (800) 945-3668;
fax (714) 261-2461

TECHNOLOGY WORKS INC.

TechWorks LC 040 Accelerator: \$877; **Ethernet cards:** \$199 to \$309; **external SCSI adapter:** \$399
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CT-20A	Auto	20" Trinitron	30-81KHz	1280x1024

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Floating-point units have been creating confusion since the days of the IIsi, and new snags affect Centris models. John Neil's SoftwareFPU can help.

BUGS & TIPS

Virtual FPU. Compatibility problems with the lack of an FPU (floating-point unit) started with the IIsi and the LC. Older versions of programs such as Microsoft Excel mistakenly assumed that FPUs were included on all 68020 and 68030 machines, and some applications require FPU hardware to function, bypassing Apple's SANE (Standard Apple Numeric Environment) for more speed at the expense of compatibility.

Programmer John Neil created a remarkable shareware utility to work around this problem. SoftwareFPU is a control panel that tricks FPU-dependent applications into believing that an FPU is installed when it is not, allowing more applications to run on the IIsi and LC, as well as Power-

Books and Performas without FPUs.

SoftwareFPU does not work on 68000-based Macs, but it works on Macs with '020 and better processors. Version 2.41 is written for compatibility with Centris models that have 68LC040 processors, which lack FPUs.

The program politely steps out of the way if a real FPU is installed or if the application calls SANE, so performance is not compromised. When an application makes direct FPU calls and SoftwareFPU mimics the absent FPU, performance is 30 percent to 85 percent of the performance obtained with SANE, Neil said.

For programs that test for the presence of an FPU (for example, Datadesk International Inc.'s DataDesk, Excel, Claris Resolve, Lotus 1-2-3 and Apple system software), SoftwareFPU tries to handle

things to facilitate the use of SANE.

The program and its documentation are well-crafted, and John Neil asks only \$10 as a shareware payment.

(On ZiffNet/Mac, SoftwareFPU is available as file SFTFPU.CPT in the Extensions library at location ZMC:DOWNTECH.)

Macsbug stops here. Programmers upgrading to lower-cost models in the Centris line are encountering a snag in support: Apple's Macsbug debugger fails with 68CL040 processors because the program expects to find an FPU in this non-FPU version of the chip. Apple's distribution policies are adding to the confusion.

As this column is being written, the latest Macsbug is an internal development version. Macsbug 6.3d4 has been released only through certain Apple channels on an "as is" basis, specifically for the Centris.

It is available through Apple's Internet ftp server (ftp.apple.com), through AppleLink and on Apple's developer CD-ROMs.

On-line services other than AppleLink have been prohibited so far from distributing anything beyond Macsbug 6.2.1, a version that is more than a year old. A newer release, Version 6.2.2, is available through the same Apple sources as 6.3d4, and, while it includes fixes for some 68040 problems, it does not support the 68LC040.

BootBeep glitches. People have reported problems with BootBeep, Robert Polic's control panel for accessing a sound and a picture hidden in Quadra ROMs (see MacWEEK, May 17). Switching on the nonstandard sound may cause problems with serial ports on some Macs, interfering with modem communications, printing and file sharing. To be on the safe side, switch the normal sound back on with BootBeep and remove it.

Retooling. FWB Inc. has released a new version of its CD-ROM Toolkit utility, plus a patching program that lets owners update their software with the changes. Version 1.0.1 adds support for several drives from NEC Technologies Inc. and other manufacturers.

Internal changes in AppleCD 300 drives are covered in the new version, and it fixes some glitches that affected Toshiba CD-ROM drives. Version 1.0.1 also improves compatibility with Insignia Solutions Inc.'s SoftPC and old CD-ROMs.

FWB is distributing the updater and release notes free through on-line services. (On ZiffNet/Mac, the file is CDT101.SEA in the Demos & Updaters library at ZMC:DOWNTECH.)

Ask David Ramsey

The sound has no meaning

Q. Is there any rationale for the different start-up sounds Macs make?

A. Not much of one. The original Mac start-up sound was a simple beep. The Mac II's impressive "bong" took advantage of the then-new Apple Sound Chip (ASC). All Macs these days have the ASC or a descendant of it, which explains why even 68000-based machines like the Portable and PowerBook 100 use the Mac II start-up sound.

The Quadra 700 and 900 introduced the "aahhh" chord to show off the Quadra's new, 16-bit sound capability (not yet supported by the Sound Manager). Mac ROMs since then have been based on the Quadra ROM, but not all Macs have the 16-bit sound hardware, so the "aahhh" sound isn't as impressive on, say, the PowerBooks.

Legend has it this sound was sampled from one of the works of Zamfir, master of the pan flute.



Q. What's the big deal with RISC (reduced instruction set computing)? Why are RISC processors faster?

A. RISC's genesis was in the 801 processor project at IBM Corp. in the late 1970s, but University of California at Berkeley Professor David Patterson is most responsible for popularizing the term and (aggressively) evangelizing the concept with his RISC 1 and RISC 2 projects in the early 1980s.

RISC's design goal is to provide the best CPU architecture for an optimizing compiler. In contrast, assembly language drives the design of CISC (complex instruction set computing) processors, whose elaborate architectures and addressing modes let a single instruction do a lot of work.

RISC processors have simpler instruction sets, higher clock rates and lots of on-chip registers. Most desktop computers use CISC chips, and modern CISC chips incorporate some RISC features, but "pure" RISC is gaining ground. RISC processors do tend to be faster than CISC, but there's a lot of argument in the academic community as to precisely why this is so — some argue that higher clock rates and other nonarchitectural features are the real reasons for the disparity. The answer's irrelevant; the future of the Mac, at least, is RISC.

Please send questions to David Ramsey on CompuServe: 76702,335 or to Ask David Ramsey, c/o MacWEEK, 301 Howard St., 15th Floor, San Francisco, Calif. 94105.

PowerPoint problem.

According to one reader who experienced a problem and verified it with Microsoft Corp., PowerPoint 3.0 has trouble saving files to various file servers, including NetWare, Vines and Pathworks. PowerPoint switches the file's modification date and creation date and leaves the file type and creator set to question marks.

The work-around is to do all your PowerPoint work on the local Mac and only copy files to the

server rather than saving them directly from PowerPoint.

IIsi sound. Sound problems with the Mac IIsi may have more than one cause. One is a speaker-contact problem, discussed here in the March 15 issue. Other problems, with a software source, may be plaguing IIsi owners. These would result in lost sound on the speaker and through the headphone output. The hardware problem affects only the speaker. □

NFS/Share v1.3 Try it for awhile!



NFS/Share 1.3 provides Macintosh users with the advantages of distributed file sharing in multivendor environments. It combines the power of the NFS protocol with the ease of the Macintosh. NFS/Share can mount remote servers either automatically at boot time or on demand via the Chooser. Users can create aliases of volumes and mount them with a double-click. Call for a free demo disk or download a demonstration copy from ftp.intercon.com.

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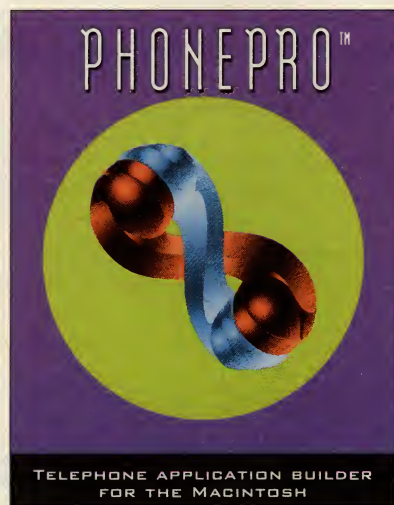
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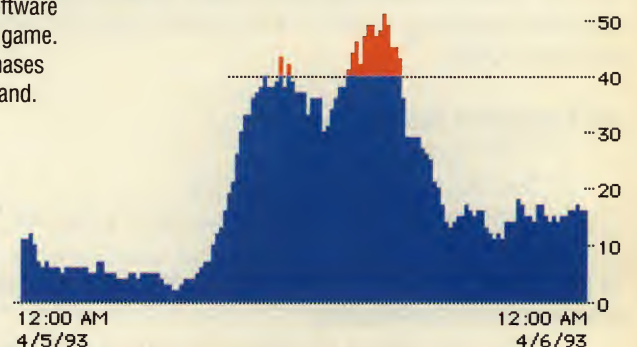
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Peak usage in histogram: 40
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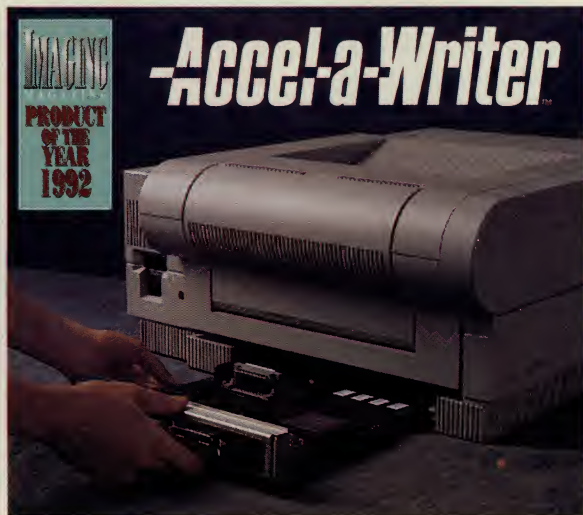
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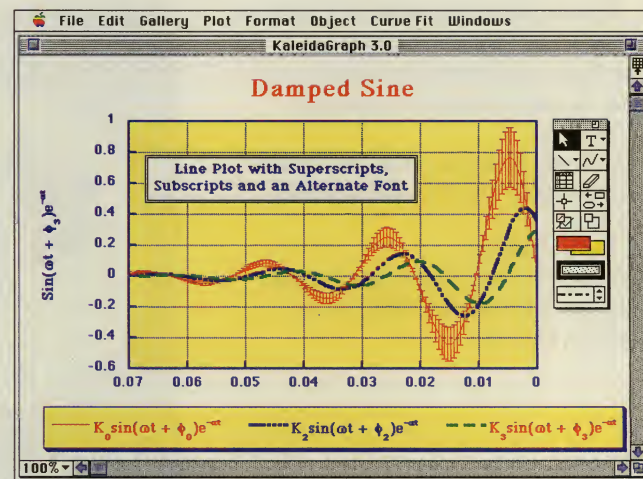
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*Showcase units are non-commissionable.

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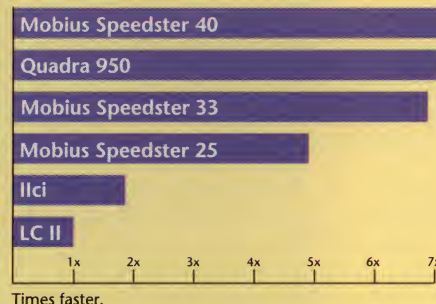
The Mobius Speedster '040 accelerator instantly gives you Quadra performance while letting you keep your investment in your current Macintosh. The 40 MHz version actually outperforms the Quadra 950. And, you won't have to mortgage the house to get the Speedster, either, with prices beginning at just \$799.

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	25MHz	33MHz	40MHz
Speedster	\$799	\$999	Call
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<small>Available for the Mac IIci, IIsi, LC, LC II, Performa 400, Mac II, IIfx, IIfx, and SE/30. Some Macs require a \$49 adapter.</small>			

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1.05GB (3 1/2")	\$1129	\$1189	\$1259
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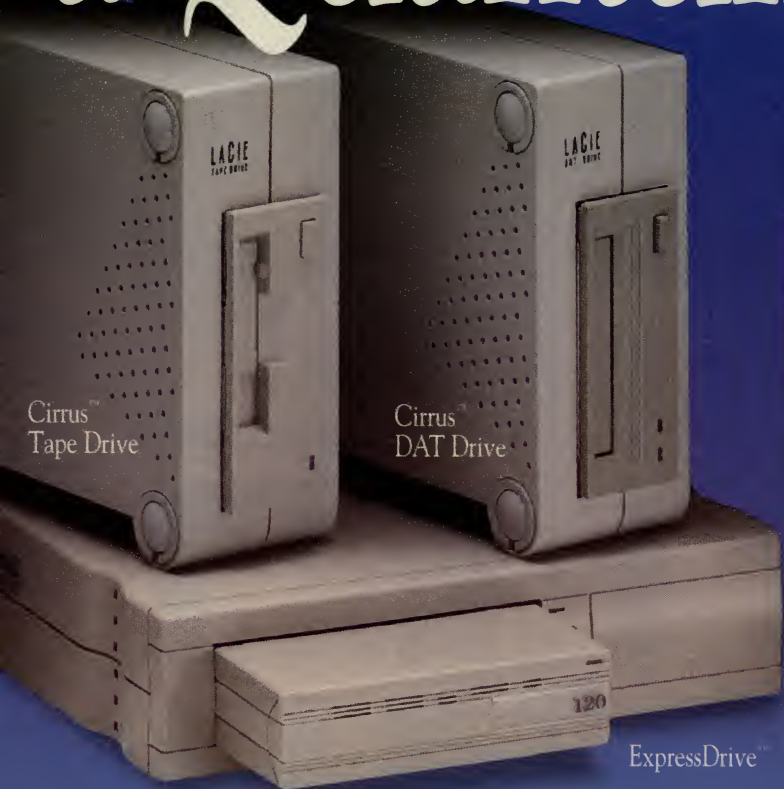
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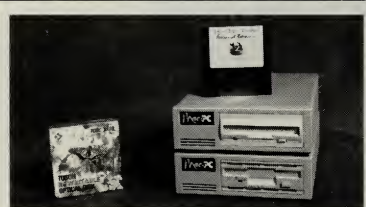
REMOVABLE MEDIA

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4.0gb - 8.0gb Compression Turbo	1339
90m / 60m Tape	16/13

Teac

150mb Tape Backup Drive	469
600mb Tape Backup Drive	669
600mb / 150mb Tape Cassette	27/18

All tape backup drives come bundled with FREE Retrospect V.2.0, one tape and have a one year warranty.

CD-ROM DRIVES

Toshiba

600mb, 200ms, 3.5"HH	539
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NEC

CD-Express	355
CD-ROM CDR-74	625
Multi-Media Gallery	805

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Formatted

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ELS 85mb	17ms	3.5"TH	185	245
ELS 127mb	17ms	3.5"TH	209	269
ELS 170mb	17ms	3.5"TH	225	285
LPS 240mb	10ms	3.5"TH	309	369
LPS 525mb	10ms	3.5"TH	799	859
Pro 700mb	10ms	3.5"HH	939	999
Pro 1.05gb	10ms	3.5"HH	1099	1159
Pro 1.22gb	10ms	3.5"HH	1199	1259
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Toshiba

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1.23gb	12.5ms	3.5"HH	1089	1149
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1.0gb	9ms	3.5"HH	1235	1295
1.03gb	15ms	5.25"FH	1175	1275
1.65gb	15ms	5.25"FH	2115	2215
2.05gb	12ms	5.25"FH	2245	2345

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Conner

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160mb	13ms	3.5"TH	239	299
206mb	12ms	3.5"TH	299	359
515mb	10ms	3.5"HH	799	859

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203mb	15ms	3.5"TH	279	339
235mb	15ms	3.5"TH	299	359
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PLEASE BE AWARE THAT SIMM PRICES ARE CHANGING ON A DAILY BASIS.

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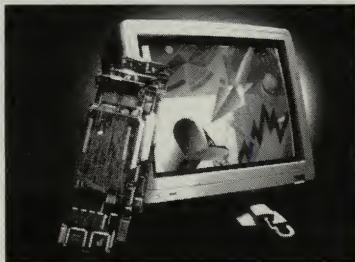
Deskwriter	409
Deskwriter 550-C	769
LaserJet 4M	1999

NEC

SilentWriter 95F Printer	1289
SilentWriter 95FX Printer	1529
SilentWriter 97F Printer	1569
SilentWriter 97FX Printer	1809
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2mb upgrade for printers	95

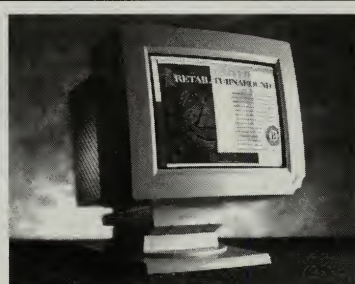
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SuperMac

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SuperMatch 20" Color	1539
SuperMatch 17" MM Color	1059
SuperMatch 17" T Trinitron	1099
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Platinum 20" TPD	879
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Rockets 33	1479
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NEC

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MultiSync 4FGe - 15" Monitor	745
MultiSync 5FGe - 17" Monitor	1145
MultiSync 5FG - 17" Monitor	1345
MultiSync 6FG - 21" Monitor	2445
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FG24x 24-bit board	1205
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UG - 630 with Typereader OCR	889
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Transparency / Slide Scanner Option	699

Microtek

ScanMaker II w/Adobe Photoshop LE	879
ScanMaker IIXe w/Adobe Photoshop FV	1175

Sharp

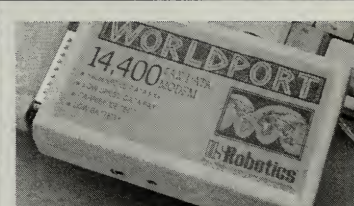
JX-320 with Adobe PhotoShop™ v2.5 FV	899
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COMstation Five	415
PowerModem I	125
PowerModem II	225
PowerModem III	315
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US Robotics

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WorldPort FAX	459
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PowerCache Adapters*	41

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TransWarp SE - 25MHz or w/FPU and 40MHz or w/FPU	185/309/259/389
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MC+IIE64 - Thick/10 Base T, 64k	145
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Lifetime warranty on cartridge.
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240mb	10ms	\$315	\$375	
525mb	10ms	\$779	\$839	

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85mb	17ms	\$189	\$249	
127mb	17ms	\$215	\$275	
170mb	17ms	\$235	\$295	

PRODRIVE SERIES 3.5" HALF HEIGHT

Unformatted	Capacity	Access	Internal	External
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700mb	10ms	\$949	\$1009	
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1.2GIG	10ms	\$1199	\$1259	

GO•Drives have 32k cache, low power consumption, MTBF of 150,000 hours, and ONE Year Warranty. ELS drives have 32k cache, low power consumption, MTBF of 250,000 hours and TWO Year Warranty. LPS drives have 64k-256k cache, MTBF of 250,000 hours, and TWO Year Warranty. PRO drives have 256k cache, MTBF of 350,000 hours, and TWO Year Warranty.

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3-5GIG	Archive Turbo DAT	DAT, DDS-DC	4mm	\$1319	\$1339
2.0GIG	WangDAT 3100	DAT, DDS	4mm	\$1045	\$1065
3-5GIG	WangDAT 3200	DAT, DDS-DC	4mm	\$1275	\$1295
2.0GIG	HP 35470A	DAT, DDS	4mm	\$1179	\$1199
3-5GIG	HP 35480A	DAT, DDS-DC	4mm	\$1299	\$1319
2-5GIG	Exabyte 8205	Helical/Compression	8mm	\$1675	\$1695
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CMO-M2511A	Fujitsu	128mb	3.5" Low Profile	35ms	\$969 \$999
CMO-OD3000	Teac	128mb	3.5" Half Height	45ms	\$939 \$969
CMO-3100E	Ricoh	128mb	3.5" Half Height	45ms	\$965 \$995
CMO-JY750	Sharp	594/652mb	5.25" Half Height	40ms	\$2069 \$2099
CMO-5031E	Ricoh	594/652mb	5.25" Full Height	28ms	\$2295
CMO-Tahiti II	MaxOptix	650mb/1.0GIG	5.25" Full Height	35ms	\$2999
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Unformatted Capacity	Model	Access Time	Actual MAC Capacity	Internal	External
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120mb	7120S	15ms	121mb	\$199	\$259
212mb	7213S	15ms	202mb	\$279	\$339
240mb	7245S	15ms	235mb	\$309	\$369
540mb	MXT-540	8.5ms	521mb	\$859	\$919
LXT & MXT SERIES (3.5" HALF HEIGHT)					
340mb	LXT-340	15ms	324mb	\$499	\$559
1240mb	MXT-1240	8.5ms	1150mb	\$1329	\$1389

Seagate



Unformatted Capacity	Model	Access Time	Actual MAC Capacity	Internal	External
3.5" HALF HEIGHT					
1.2GIG	ST11200N	10.5ms	1000mb	\$1125	\$1185
2.4GIG	ST12400N	9ms	2000mb	\$2195	\$2255
2.4GIG	ST12550N Barracuda	8ms	2050mb	\$2499	\$2559
5.25" FULL HEIGHT					
1.6GIG	ST41651N	Wren-8	15ms	1350mb	\$1349 \$1449
2.1GIG	ST42100N	Wren-9	12.9ms	1900mb	\$1725 \$1825
1.6GIG	ST41600N	Elite-1	11.5ms	1307mb	\$1799 \$1899
2.4GIG	ST42400N	Elite-2	11ms	2050mb	\$2355 \$2455
3.4GIG	ST43400N	Elite-3	11ms	2750mb	\$2949 \$3049

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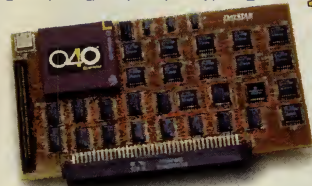
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MAC IIFX

1MB / 4MB / 16MB FX.....	\$37 / 130 / 553
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CENTRIS 610/650/LCIII

4MB / 8MB / 16MB.....	\$125 / 265 / 565
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DUO 210/230

4MB / 8 MB	\$199 / 355
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POWERBOOK 140/145/170

4MB / 6MB	\$165 / 219
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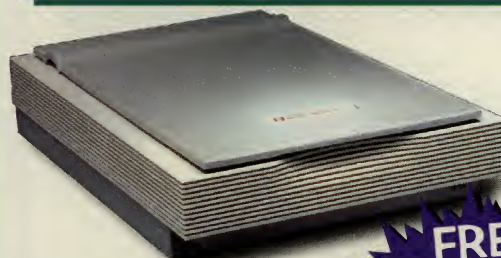
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Capacity (MB)	Model Number	Av. Acc. Time (msec)	Transfer rate (K/sec)	MFG warranty (mos)	Int. Drive Price	Zero FP Drive Price	Compact Drive Price
Conner							
85	CP-30080E	16	1300	24	\$199	\$259	
120	CP-30100	16	1300	24	\$259	\$309	
170	CP-30170E	16	1400	24	\$269	\$329	
213	CP-30200	15	2000	24	\$349	\$399	
Quantum							
85	ELS 85S	17	1800	24	\$179	\$249	
127	ELS 127S	17	1800	24	\$199	\$279	
170	ELS 170S	17	2000	24	\$219	\$299	
240	LPS 240	16	2300	24	\$299	\$389	
120 (Pwrbk)	GO 120	17	1900	12	\$299		
Digital							
1.05GB	DSP-3105	9.5	2600	60	\$1,249	\$1,299	\$1,349
Seagate							
1.05GB	ST-11200N	10.5	3200	60	\$999	\$1,049	\$1,099
Fujitsu							
520MB	M2624ESA	9	2700	60	\$799	\$859	\$899
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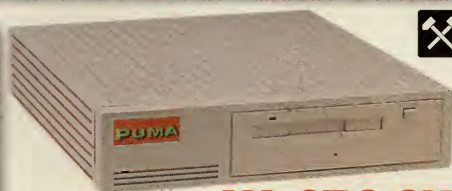
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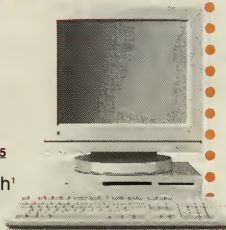
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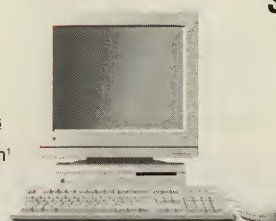
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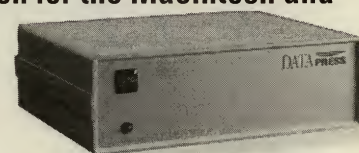
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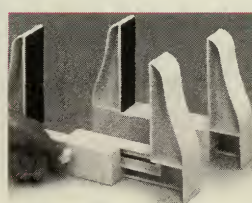
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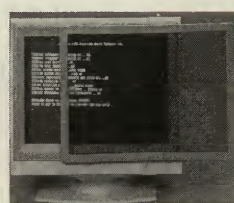
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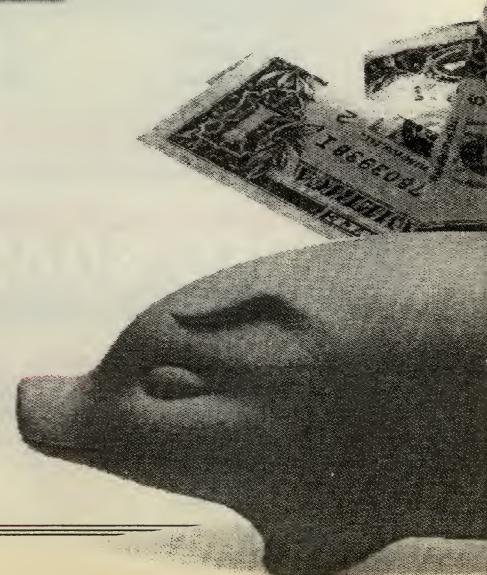
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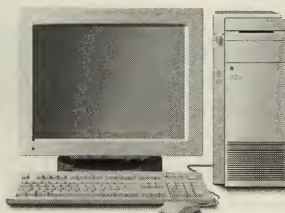
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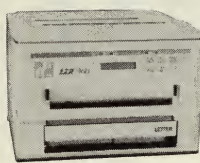
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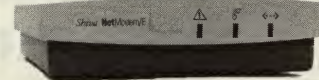
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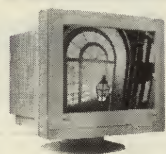
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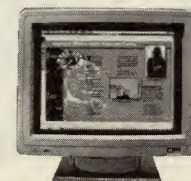
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• Receive and print conventional faxes
or high-quality PostScript faxes

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1560 Toner. \$249

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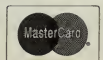
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Accelerators

DAYSTAR DIGITAL

Model	Without FPU	with FPU
33 MHZ Powercache	\$375	\$465
40 MHZ Powercache	\$545	\$635
50 MHZ Powercache	\$714	\$845
Powercache Adapter		\$40
Fast Cache Quadra 700, 900		\$249
Fast Cache Quadra (all)		\$375
33 MHZ Turbo 040		\$1345
Fast Cache Turbo 33-128k		\$179
Charger for Photoshop		\$799

SyQuest

Unformatted Capacity Includes one free cartridge (2 year Warranty)	Access Time	Price
44 mb External	19 ms	\$378
88C mb External	19 ms	\$568
105 mb External	14.5 ms	\$728



CD ROMS



Airbourne's Texcel

External CD-ROM Drive \$448

265ms, Multisession, DualSpeed, SCSI-II

Toshiba 3401 Ext Drive \$498

200ms, Multisession, DualSpeed, SCSI-II

NEC Intersect Ext Drive \$169

625ms, Model CDR 25, Single Session, Single Speed, SCSI-I

Note: Bundles are only for sale with purchase of an Airbourne CD-ROM Drive

Reference Bundle

- The New Grolier Multimedia Encyclopedia
- World Atlas • CIA World Fact Book

89.00

Education Bundle

- MACnificent 7 Education & Games for System 7
- Mayo Clinic • U.S. History

89.00

Childrens Bundle

- Interactive Storytime • US Atlas
- Velveteen Rabbit & Other Children's Classics

79.00

Entertainment & Games Bundle

- Animals - San Diego Zoo • Lucas Game Pack
- Guinness Book of World Records • Sherlock Holmes

89.00

Clip Media & Fonts Bundle

- Font Fun House • Font Pro Vol. 1/The Essentials
- Publish It! 2.0 with Clip Art Fonts • Color it!

69.00

Modems

PROMETHEUS

All units come with MacFAX & MacKnowledge Software Price

Ultima Home Office
ext 14.4/14.4SR Fax w/ V.42 bis & voice \$398

Promodem 144i Internal for Powerbook
14.4/14.4SR Fax w/ V.42 & V.42 bis \$268

Promodem 144e
ext 14.4/14.4 SR Fax w/ V.42 & V.42 bis \$258

Promodem 24e ext 24/96SR Fax w/ V.42 & V.42 bis \$128

Promodem Mini 2400 2400 BPS mini, data only \$79

ZOOM TELEPHONICS

All units come with Microphone LT & STF FAX Software Price

Faxmodem PBK for Internal Powerbook
96/48 SR Fax w/2400 BPS Modem \$99

Faxmodem PKT Portable
96/48 SR Fax w/2400 BPS Modem \$109

Faxmodem FXV
V42 bis/MNP5/2400 BPS, 96/96 SR Fax \$129

Faxmodem VFX V.32
V.32 bis, 14.4 data & fax, V.42 bis/MNP5 \$258

Scanners

UMAX

All Scanners includes free software

Model	Price
UC630 - Color w/free Photoshop v2.5	\$1078
UC1200s - Color w/free Photoshop v2.5	\$2948
UC840 - Color w/free Photoshop v2.5	\$1248
Transparency Unit	\$698
Auto Document feeder	\$398
UG630 - Greyscale w/free Typereader	
OCR, OFOTO & Publish It	\$848

Optical & DAT Drives

Includes one free disc (1 year Warranty)

128 mb Panasonic Optical	39 ms	\$838
128 mb Epson Optical	29 ms	\$988
256 mb Most Optical	31 ms	\$1598

Unformatted Capacity	W/Retro	W/Retro Remote
Includes free 90m Tape & Retrospect or Retrospect Remote software		
WangTek 2.1 Gig DAT	\$998	\$1198
WangDat 5.0 Gig DAT	\$1298	\$1498

Memory

Model	60 NS	70 NS	80 NS	Model	60 NS	70 NS	80 NS
1x8	Call	\$37	Call	2x8	Call	\$66	Call
4x8	Call	\$137	Call	16x8	Call	\$555	Call

We carry most Mac Memory, Please Call for prices!

Memory for LCIII, Centris 610, 650

4mb \$139	8mb \$279	16mb \$599
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Hard Drives

CONNER

Unformatted Capacity	Access Time	Internal	External
3.5" Disk Drives (2 year Warranty)			
85 mb LPS	17 ms	\$178	\$238
170 mb LPS	12 ms	\$248	\$298
212 mb LPS	9 ms	\$318	\$378
540 mb	8.5 ms	\$848	\$898

QUANTUM

ELS Series (3.5" Low Profile and Low Power Drives)			
85 mb	17 ms	\$188	\$248
127 mb	17 ms	\$218	\$278
170 mb	17 ms	\$238	\$298
LPS Series (3.5" Low Profile and Low Power Drives)			
240 mb	10 ms	\$318	\$378
525 mb	10 ms	\$838	\$898
Prodrive Series (3.5" Half Height Drives)			
1.0 Gig	10 ms	\$1148	\$1228
1.2 Gig	10 ms	\$1298	\$1348
GO•Drive 2.5" Hard Drive (All Quantums - 2 year Warranty)			
160 mb	17 ms	\$499	\$599

TOSHIBA

3.5" & 2.5" Disk Drives (2 year Warranty)			
2.5" 213 mb	12 ms	\$548	\$648
3.5" 830 mb	12 ms	\$1029	\$1089
3.5" 1.2 Gig	12 ms	\$1298	\$1348

FUJITSU

3.5" & 5.25" Disk Drives (5 year Warranty, 3 year on 105mb)			
3.5" 105 mb	9 ms	\$178	\$228
3.5" 520 mb	9 ms	\$748	\$848
3.5" 1.1 Gig	8.5 ms	\$1178	\$1278
5.25" 1.2 Gig	11.5 ms	\$1148	\$1238
5.25" 2.06 Gig	11.5 ms	\$2098	\$2198
5.25" 2.4 Gig	11.5 ms	\$2298	\$2378

SEAGATE

3.5" Half Height Drives (1 and 5 year Warranties)			
1.2 Gig	10.5 ms	\$1128	\$1198
Wren and Elite Series (5.25" Full Height Drives)			
Wren 8 1.6 Gig	15 ms	\$1328	\$1408
Wren 9 2.1 Gig	12.5 ms	\$1698	\$1788
Elite 1 1.6 Gig	11.5 ms	\$1798	\$1888
Elite 2 2.4 Gig	11 ms	\$2398	\$2488
Elite 3 3.4 Gig	11 ms	\$2998	\$3048

Media

Model	QTY 1	5PK	10PK	Model	QTY 1	5PK	10PK
SyQ44 cart	\$67	\$65	\$63	128mb OPT	\$39	\$37	\$35
SyQ 88 cart	\$107	\$104	\$99	256mb OPT	\$86	\$84	\$79
SyQ 105 cart	\$79	\$76	\$72	90mm DAT	\$19	\$17	\$14

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The APS Turbo DAT is based on Archive's Turbo Python DAT Mechanism, the fastest DAT mechanism available. The APS Turbo DAT is more than 20% faster than all other DAT units and can store up to 5GB on a 90 meter tape.

APS T 155

The APS T 155 tape backup system was voted the Editor's Choice for personal tape backup by MacWorld magazine. With backup rates of up to 5MB-per-minute on a local Mac, you know you can depend on it for day-to-day backups of your important data.

The Best Media Available

If you need tapes, our Maxell 60m and 90m DAT and 155MB and 600MB Teac tapes are the best data grade tapes available. Our 60m tapes are \$12 each or 10 for \$110; 90m tapes are \$16 each or 10 for \$130. Our 155MB tapes are \$19; 600MB tapes, \$35.

APST 155
\$499



APST 600
\$699



APS T 600

The APS T 600 is a medium capacity backup system that fills the void between the APS T 155 and APS DAT backup systems. The APS T 600 is an excellent choice for local volume backup at rates as high as 7MB-per-minute and works well for backing up small and medium sized networks.



*A copy of Retrospect
included with
all Tape drives*

→ DAT

Model	Internal*	External
APS TurboDAT	\$1299	\$1399
APS DAT	1099	1199

*Internal models for Quadra 900 & 950
All APS DAT Drives Include Retrospect by Dantz

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APS T 155 MB Tape Back Up	\$499
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The APS MS 1.2 provides the best mix of performance and price in its class. The 5400 RPM spindle speed of its Micropolis 2112 mechanism delivers spectacular sustained transfer rates that run as high as 2.9MB-per-second. With seek times averaging 9.1 ms, you can see why this is the ideal high-capacity drive for high-performance applications. Ideally suited for internal or external use with Mac II, fx, ci, Quadra 700, 800, 900 and 950, The APS MS 1.2 fits in any of our external enclosures and is compatible with all Macintosh models. Additionally, it fits internally in the SE, SE/30, Mac II, IIx, and cx. With an impressive 300,000 hour MTBF and a five-year warranty, this is a drive to look at when you need high-capacity and high-performance in a compact package.



Mac USER
LABS

★★★★½

APS MS 1.2 Internal
\$1299

APS MS 1.2 External
\$1369

APS HARD DRIVES

Model	Internal	External
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QUANTUM

APS Q 85 EL ² Quantum 85ELS mechanism	\$189	\$259
APS Q 127 ² Quantum 127ELS mechanism	219	289
APS Q 170 ² Quantum 170 ELS mechanism	239	309
APS Q 240 ² Quantum LP240 mechanism	329	399
APS Q 525 ² Quantum Lps525 mechanism	799	869
APS Q 1225 ⁵ Quantum 1225P mechanism	1299	1369

TOSHIBA

APS T 1.2G ³ Toshiba MK-538 mechanism	999	1069
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1-5 Denotes length of manufacturer's warranty

Model	Internal	External
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MAXTOR

APS MX 245 ² Maxtor 7245 mechanism	339	409
APS MX 345 ² Maxtor 7345 mechanism	499	569
APS MX 540 ² Maxtor MXT540 mechanism	899	969
APS MX 1240 ³ Maxtor MXT1240S mechanism	1499	1569

Dantz's Disk Fit
Direct included with
all drives



Model	Internal	External
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MICROPOLIS

APS MS 560 ⁵ Micropolis 2105 mechanism	\$899	\$969
APS MS 1.2G ⁵ Micropolis 2112 mechanism	1299	1369
APS MS 2.4G ⁵ Micropolis 1924 mechanism	2599	2699
APS MS 3.0G ⁵ Micropolis 1936 mechanism	2999	3099



FUJITSU

APS F 520 ⁵ Fujitsu M2624S mechanism	759	829
APS F 1.2G 5.25" ⁵ Fujitsu M2266 mechanism	1249	1349
APS F 1.2G 3.5" ⁵ Fujitsu M2694 mechanism	1199	1269
APS F 2.0G ⁵ Fujitsu M2652 mechanism	2249	2349

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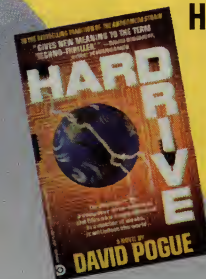
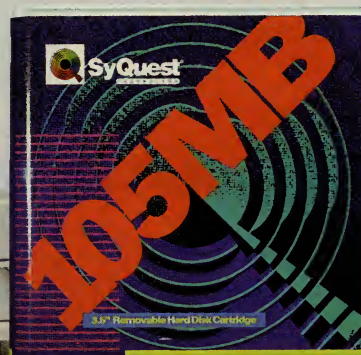
SYQUEST

Model	MB	External
APS SQ555	44MB	\$389
APS SQ5110	88MB	489
APS SQ5110c	44/88	569
APS SQ3105	105MB	749

NEW

APS SQ 3105

The new APS SQ 3105 packs a whopping 105MB of storage in a small, light 3.5" cartridge that's only a little larger than a floppy disk. The compact drive unit weighs in at a light 3.7 lbs, and measures just 7.25" x 3.1" x 4.6". Delivering impressive sustained transfer rates as high as 1.2 MB/sec. and seek times as low as 12ms, this is one option you really should consider if you need transportable storage with the performance of a hard disk drive.



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MODEMS

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2400 baud (9600 send fax/4800 receive fax)	\$69
9600 baud v.32	279
14,400 baud v.32 bis	299

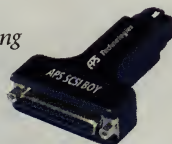
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Model	Internal	AC/DC Case
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APS 120[†]	329	459 [†]
APS 160GRS[†]	459	589 [†]

†Battery-Powered Companion Case for the PowerBook

TOSHIBA

APS T 213[†]	569	699 [†]
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Toshiba 2224 mechanism

†Battery-Powered Companion Case for the PowerBook



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SuperMac 21" Mono/Grayscale...**1069**

20" Monitors

Radius Intellicolor 20i.....**\$2759**
RasterOps 20/20™ MultiScan.....**1499**
RealTech 20" Trinitron Multi-Mode.....**1895**
SuperMac 20" (SuperMatch).....**1549**
SuperMac 20" (SuperMatch 20•T Multi-Mode XL).....**2649**

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Mitsubishi 17" Diamond Pro.....**\$1199**
NEC 17" 5FG Color.....**1299**
Seiko Instruments 17" (CM1760LR).....**1089**
Sony 17" 1730.....**1149**
SuperMac 17" (SuperMatch).....**1069**
SuperMac 17" Trinitron.....**1039**

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E-Machines 16" Color (ColorPage T16II).....**\$1299**
RasterOps Sweet 16.....**1199**

15" Monitors

NEC 15" 3FG Color.....**\$699**
NEC 15" 4FG Color.....**889**
Radius 15" Precision Color Pivot.....**989**
RealTech 15" Grayscale (PageView GS).....**449**
Sigma 15" Grayscale (Power Portrait).....**599**

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Mitsubishi 14" Diamond Scan.....**\$429**
Sony 13" Color 1430.....**699**

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E-Machines

ColorLink DC/T.....**\$499**
ColorLink SX/2.....**649**
Futura SX24.....**479**
DoubleColor LX (8).....**649**

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Spectrum/24 PDQ Plus.....**\$1519**
Spectrum/8 NuBus.....**419**
Spectrum/8LC II, IIsi.....**499**
Spectrum/24 Series IV.....**829**
Spectrum/8•24 PDQ.....**789**
Spectrum/8•24.....**609**
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MICROTEK

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Microtek Scanmaker IIXE.....**1,179**
RealTech Scan 800.....**1,099**
w/Photoshop.....**1,299**
RealTech Scan 800 w/Transparency Option.....**1,595**

SCANNERS

RealTech Scan 800 with Transparency Option



UMAX UC 630.....**\$1,119**
UMAX UC 630 w/Transparency Option.....**1,798**
UMAX UC 840.....**1,299**
UMAX UC 840 w/Transparency Option.....**1,978**

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RasterOps CorrectPrint 300i Dye Sublimation Printer w/36 MB.....**\$6,995**
RealTech Color 350.....**5,995**
QMS 210.....**4,699**

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NEC Silentwriter 95fx.....**1729**
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Radius Rocket 33.....**1549**
SCSI II Booster.....**249**
Rocket Share.....**419**



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EtherGate Router.....**1239**
NetSerial.....**269**
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NetModem v.32 (for LocalTalk).....**989**
LanRover/L.....**579**
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Connects Mac II computers to thick, thin, fiber optic or 10Base-T Ethernet cable systems. Includes an RJ-45 jack for 10Base-T wiring.
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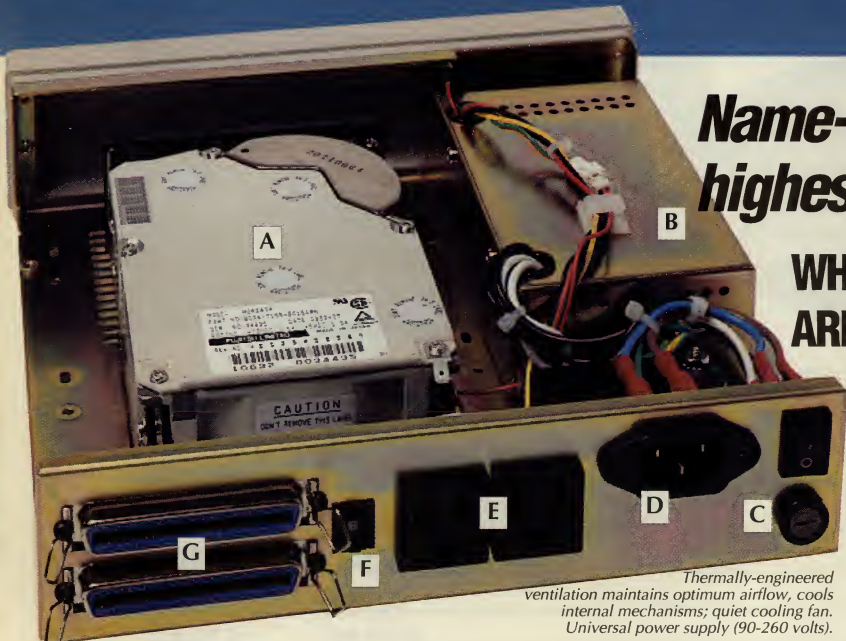
DaynaPort E/Z. Ideal for Macs that don't have a slot for a network interface card.
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	Model number	Internal price	External price	Formatted Mac capacity (in MB)	Average access time (in ms)	Transfer rate* (in MB/second)	Form factor**	Warranty (years)
80 - 120 MB								
Conner 85	CP-30080E	\$209	\$279	82	17	1.5	LP	1
Quantum 85	ELS85	199	269	82	17	1.4	LP	2
Conner 120	CP-30100	259	329	116	17	1.5	LP	1
Maxtor 120	7120	209	279	121	15	1.5	LP	2
120 - 250 MB								
Quantum 127	ELS127	\$229	\$299	124	17	1.4	LP	2
Conner 170	CP-30170E	259	329	160	9	1.5	LP	1
Quantum 170	ELS170	259	329	160	17	1.4	LP	2
Conner 212	CP-30200	359	429	206	12	2.5 ¹	LP	1
Maxtor 213	7213	299	369	207	15	2.8 ¹	LP	2
Quantum 240	LPS240	339	409	234	10	1.4	LP	2
Maxtor 245	7245	329	399	245.6	15	3.0 ¹	LP	2
320 - 570 MB								
Maxtor 340	LXT-340	\$599	\$669	324	15	2.1 ¹	HH	2
Fujitsu 520	M2624FA	799	869	496	9	2.7 ¹	HH	5
Quantum 525	LPS525	899	969	525	10	2.9 ¹	LP	2
Maxtor 540	MXT-540	919	989	546	9	5.5 ²	HH	2
Conner 540	CP-3540	899	969	515	12	5.5 ²	HH	1
Micropolis 560	M2105	1049	1119	532	10	5.0 ²	HH	5
700 MB - 1.3 GB								
Quantum 700	PRO700	\$1199	\$1269	670	10	2.9 ¹	HH	2
Micropolis 800	M2108	1199	1269	698	10	5.0 ²	HH	5
Toshiba 877	MK-438FB	1099	1169	830	12.5	3.0 ¹	HH	2
Quantum 1050	PRO1050	1239	1309	1000	10	2.9 ¹	HH	2
HP 1050	97558	1649	1749	987	13.5	2.8 ¹	FH	5
Fujitsu 1.2	M2266	1249	1349	1079	14.5	3.0 ¹	FH	5
HP 1.2	C2247	1589	1659	1000	10.5	5.3 ¹	HH	5
Micropolis 1.2	M2112	1249	1319	1005	10	5.0 ²	HH	5
Quantum 1.2	PRO1225	1419	1489	1200	10	2.9 ¹	HH	2
Toshiba 1.2	MK-538FB	1399	1469	1200	12.5	4.0 ¹	HH	3
Maxtor 1.2	MXT-1240	1399	1469	1240	9	4.5 ²	HH	3
Conner 1.3	CP-31370	2059	2129	1030	10.5	6.0 ¹	HH	1
1.5 - 3.6 GB								
Fujitsu 2.0	M2652	\$2199	\$2299	1752	11	4.8 ²	FH	5
Seagate 2.1	ST42100N	1699	1799	1900	12.9	3.9 ²	FH	5
Fujitsu 2.4	M2654	2399	2499	2000	11	4.8 ²	FH	5
Micropolis 2.4	M1924	2599	2699	2100	10	4.8 ²	FH	5
Seagate 2.4	ST42400N	2549	2649	2050	11	4.5 ²	FH	5
HP 2.4	C3010	2899	2999	2000	11.5	5.3 ²	FH	5
Seagate 3.4	ST43400N	3399	3499	2750	11	6.0 ²	FH	5
Micropolis 3.6	M1936	3299	3399	3022	10	6.0 ²	FH	5

* Transfer rate (or throughput) depends on your Mac CPU and system configuration. For more information, ask your Hardware That Fits sales partner. ** Form Factor Low Profile (LP)=3.5 Half Height (HH)=3.5 Full Height (FH)=5.25 ¹ SCSI-2 ² SCSI-2 Fast These drives are most efficient when used with a Macintosh Quadra 800, 950 or a RealTech SCSI-2 card.



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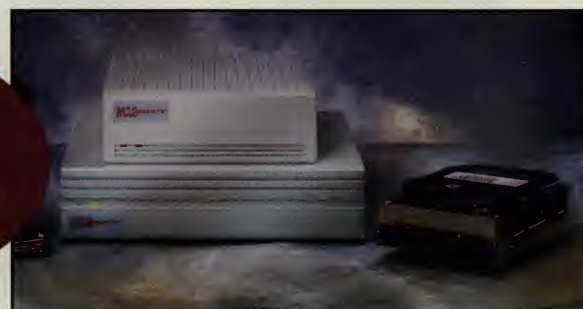
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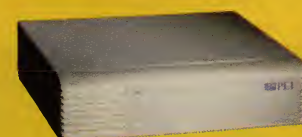
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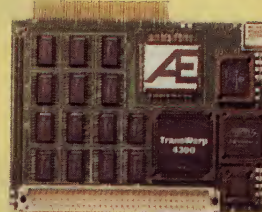
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PB160/180-6MB	235
PB160/180-8MB	349
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PB165C/8MB	409
PB165C/10MB	529
PBDUO 210/230-4MB	199
PBDUO210/230-6MB	279
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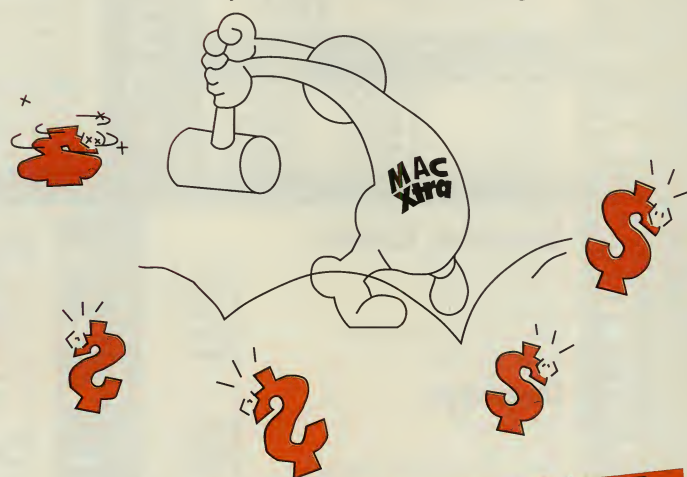
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"The MicroMac MultiSpeed 25MHz...deserves mention for offering solid performance at an exceptionally low price."
MacUser, April 1993

Upgrade Tip of the Week

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- Add up to 16MB of physical or virtual memory
- 650% speed increase
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Mac2VGA cable Connects cost-effective VGA monitor to most color Macs.....	\$20

Acceleration CPU/FPU Upgrades

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LogiCache 50MHz '030 For Mac SE/30, II, IIsi, IIci, IIvx, IIvi, Performa 600	\$679
with FPU (68882).....	\$779
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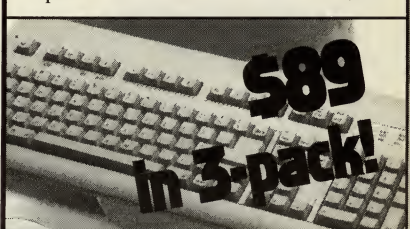
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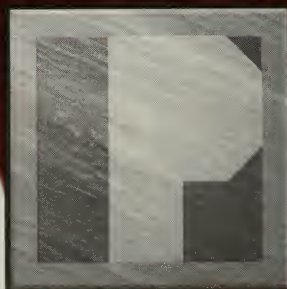
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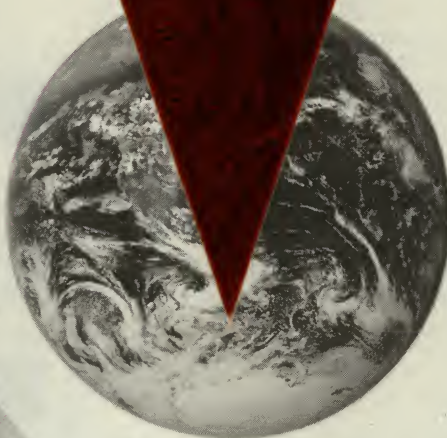
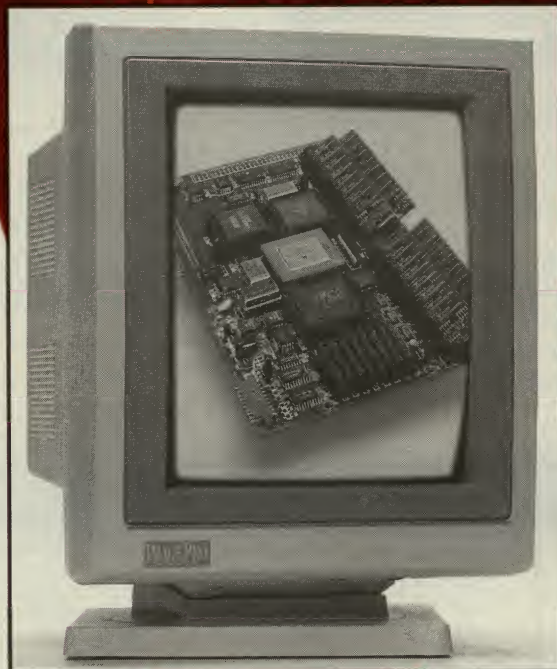
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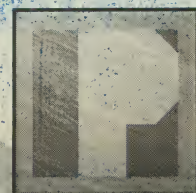
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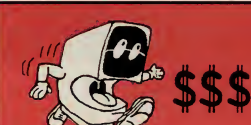
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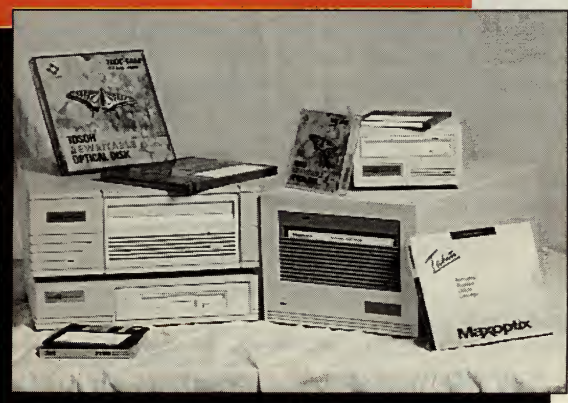
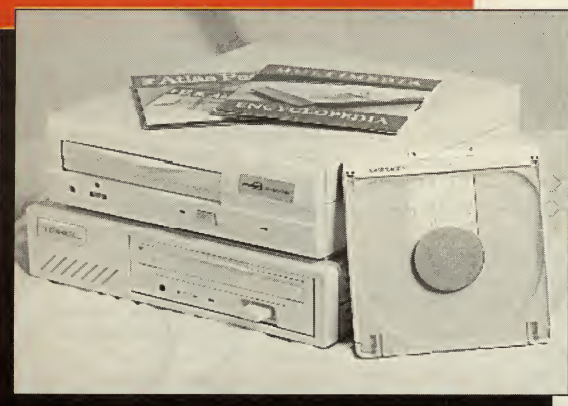
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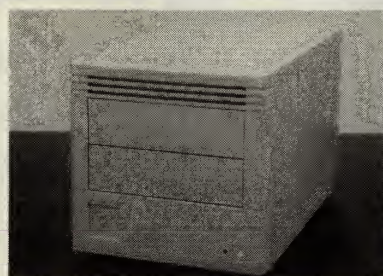
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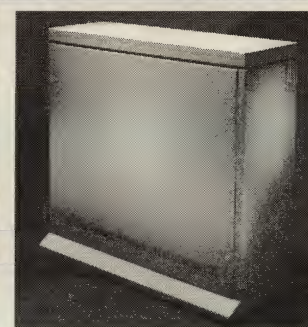
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425	M2623FA	3.5	12	\$ 714	\$814
520	M2624FA	3.5	12	\$ 725	\$820
1079	M2266S	FH	14	\$1189	\$1309
1080	M2694FA	3.5	10	\$1098	\$1198
1750	M2652S	FH	11	\$2033	\$2163
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850	DSP3085S	3.5	9.5	\$1192	\$1287
1050	DSP3105S	3.5	9.5	\$1158	\$1253
1660	DSP3160S	3.5	10	\$1599	\$1695
2000	DSP5200S	FH	12.5	\$1904	\$2024
3500	DSP5350S	FH	11.5	\$3246	\$3366

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MB	TYPE	SIZE	SEEK	INT.	EXT.
560	2105	3.5	10	\$889	\$984
698	2108	3.5	10	\$1093	\$1193
667	1624	HH	15	\$1028	\$1128
1050	2112	3.5	10	\$1094	\$1194
1340	1528	FH	14.5	\$1309	\$1439
1380	1908	FH	11.5	\$1812	\$1932
2100	1924	FH	11.5	SCALL	SCALL
3050	1936	FH	11	\$2993	\$3123

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245	ST3283N	1"	12	\$ 340	\$ 440
456	ST3550N	1"	12	\$ 815	\$ 915
540	ST3600N	1"	10.5	\$ 855	\$ 955
665	ST4767N	FH	12	\$1025	\$1125
*860	ST1980N	3.5	9.9	\$977	\$1077
1037	ST41200N	FH	16	\$1047	\$1147
*1037	ST11200N	3.5	10.5	\$1047	\$1142
1420	ST41650N	FH	15	\$1228	\$1348
1420	ST41600N	FH	11.5	\$1695	\$1815
*1900	ST42100N	FH	12.9	\$1580	\$1700
*2100	ST42400N	FH	11	\$2217	\$2337
*2900	ST43400N	FH	11	\$2808	\$2928

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TYPE	MB	SIZE	SEEK	INT.	EXT.
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Seagate	1.04GB	3.5"	10	\$1047	\$1142
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540	LXT540SY	3.5	8.5	\$ 899	\$994
1240	1240S	3.5	8.5	\$1263	\$1358
1059	PO-12S	FH	13	\$1063	\$1193
1345	P1-17S	FH	13	\$1265	\$1395

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1050	PD1050S	3.5	10	\$1083	\$1178
1200	PD1225S	3.5	10	\$1216	\$1311

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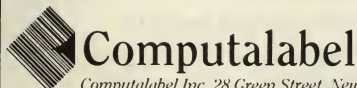
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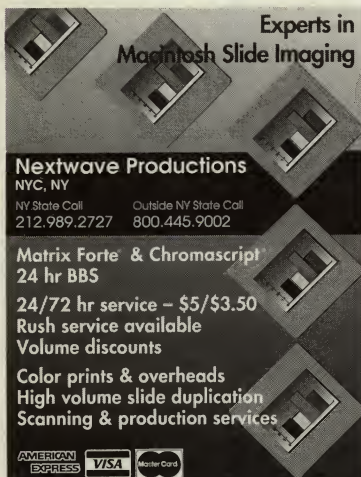
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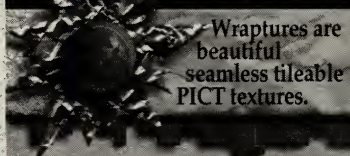
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New Macs

From Page 1

72-pin SIMMs and a 230-Mbyte hard drive. The 840av's video RAM can be upgraded to 2 Mbytes, which will support 24-bit color on 21-inch displays. The street price for this configuration will reportedly be about \$4,200.

► **Centris 660av.** Designed to make the av capabilities accessible to mainstream consumers, the 660av comes in a Centris 610 chassis with one 7-inch NuBus slot that requires an

adapter card, which is sold separately; space for two internal SCSI devices; and 4 Mbytes of RAM, expandable to 68 Mbytes.

The Centris 660av also sports a user-upgradable 25-MHz 68LC040 — the '040 without an FPU (floating-point unit). Sources said street prices for a 660av with an 80-Mbyte hard disk should start at \$2,300.

Both Macs will reportedly have optional 500-Mbyte hard disks and CD-ROM drives.

The av Macs have many features in com-

mon. Most of the new technology offered on them is geared to improve and extend the performance of audio and video activities (hence the "av" suffix). Both will be able to capture and output 16-bit color, NTSC and PAL (European) video in composite and S-video formats.

The new Macs will include AT&T Co.'s 3210 DSP, which is used for voice recognition and synthesis, among other tasks. Third-party developers will be able to take advantage of

the chips in telephony, graphics, number-crunching and other applications. Additionally, the DSPs will give both Macs the power to output 16-bit stereo sound at sample rates as high as 48 kHz.

Both Macs will have a GeoPort for serial and network communications. Apple is expected to include DSP-based software that lets the DSP and GeoPort emulate a 14.4-Kbps modem. Built-in Ethernet is standard on both models, sources said.

The av Macs will let peripherals have direct memory access to the CPU buses. This will allow the transfer of large amounts of data across and between buses without slowing the main processor. The Macs' NuBus technology has also been updated, improving the speed of data transfers to and from the main processor bus. For the first time, cards plugged into a NuBus slot will be able to shut down and start up a Mac.

The internal and external SCSI ports of both models are terminated automatically when no devices are connected.

Much of current Mac system software will be stored inside the av Macs' 2-Mbyte ROMs, reducing RAM requirements for the operating system. The 660 and 840 will be the first Macs to include Apple's Casper voice recognition. However, most application software will have to be rewritten to support voice recognition. □

Apple

From Page 1

To remedy the situation, Sculley hinted at "aggressive action to accelerate sales momentum."

Bill Slakey, a spokesman for Apple's Investor Relations department, said the company will likely reduce Mac prices to stimulate demand and remain competitive with Windows-based machines. He declined to comment on which systems would be affected by the price cuts.

Financial analysts said Apple will also be forced to cut its work force. "A meaningful reduction in head count is inevitable," said David Wu, an analyst at S.G. Warburg & Co. of New York. In Apple's last major layoffs, the company dismissed 1,500 employees in 1991 when profit margins began to shrink.

Apple Treasurer Mary Ann Cusenza refused to comment on layoffs. She said supply constraints that hampered sales during the past seven months would be over soon, enabling Apple to maintain a steadier revenue stream.

However, analysts said Apple's problems run deeper: They say the company's costly infrastructure must be modified to cope with dwindling margins while maintaining sales momentum and market share.

"The market has shifted from a seller's to a buyer's market. [Apple] is going to have to cut prices and expenses to get costs in line," said Andrew Neff, an analyst at Bear Stearns, one of the first New York-based brokerage firms to change its rating on Apple to "buy" from "strong buy" earlier this month. The firm subsequently downgraded Apple to "hold" status.

For Apple's most recently reported quarter, its second quarter of fiscal 1993 ended March 26, profits slid 18 percent to \$110.9 million, even though sales rose 15 percent to \$1.97 billion (see MacWEEK, April 19). Meanwhile, margins slipped to 38.5 percent, compared with 44 percent a year ago.

Analysts said that the company has to cut its

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Open systems

From Page 1

will first be available for PowerOpen Unix in the first quarter of 1994.

The ported environment will not be a complete Macintosh, however. For example, Apple said the first product will probably not include AppleTalk protocols, and it will have "limited" network capability.

Some analysts said they felt Apple's plans could benefit Unix users who are constrained with fewer productivity applications than their Mac counterparts. But they also said the Unix component of Apple's Companion strategy may vie with Sun Microsystems Inc.'s and Insignia Solutions Inc.'s recently announced plans to allow Microsoft Windows applications to run under Unix. Also competing is Quorum Software Systems Inc.'s Equal, a long-promised "application adapter" that is due to ship this week. Equal lets users of Unix's Motif or Open Look run Mac versions of Microsoft Word and Excel as if they were native applications.

"Running Mac applications and services on Unix is the right strategy for Apple, but I see it as a reaction to what's happening with cross-platform Windows and NT, and for that it might be too late," said Joyce Gavenda, an analyst at Summit Strategies Inc. of Boston. "And even apart from Sun's and Insignia's future plans, Quorum is here right now."

operating expenses, which equaled 30 percent of its sales in the most recent quarter. This was more than twice the ratio of overhead costs to sales for Compaq Computer Corp., the third largest computer maker, after IBM Corp. and Apple.

"For Apple to be competitive in calendar 1994, it has to drop its operating expenses to 20 percent of revenue," Wu said.

Even Apple's Cusenza admitted, "Over time, we need to look at the whole business model."

Other analysts said they are equally concerned by an apparent glut of Apple products in the channel. One New York investor who asked not to be identified said, "The PowerBook cycle is getting long in the tooth, the Duos simply aren't selling, and [Hewlett-Packard Co.] is beating up on Apple in the peripherals market."

This summer's expected delivery of the Newton is not expected to bolster earnings because of its razor-thin margins. "Apple will be happy if sales cover overhead the first year," Wu said.

In the long run, Apple hopes to ease its financial burden by increasing its alliances and strategic relationships. Additionally, while Newton hardware sales are a loss leader, fees from licensing the Newton OS should help bolster margins.

"Working with IBM and Motorola on the software side is a step in the right direction," said Walter Winnitzki, an analyst at Dillon Read, a New York-based investment banking company. "It helps Apple offload some of its costs. And over time, its cost structure will go down. They are in a two-year transition, but their margins are under pressure immediately."

Despite the slide in Apple's stock price, several analysts remained bullish on the company. "They have excellent cash flow and equity," said Michael Murphy, editor of California Technology Stock Letter in Half Moon Bay, Calif. "It's a financial position that most companies would like to be in." □

Marty Chavez, Quorum chief technical engineer, said Equal's capability to trap and translate all the Mac application calls to go through the Unix OS gives it a performance advantage over Apple's approach of translating the Mac OS and Toolbox and having them sit on top of Unix.

But many of the most-distinctive Macintosh services, such as the Finder and QuickTime, do not have a counterpart on the Unix side, so they won't be available to an Equal

user. Bruce Cleveland, senior director of Apple's Open Systems business unit, said future plans to implement most of those services as native RISC processes will help differentiate Apple from other approaches.

Cleveland said developers will be able to write what he called "symbiotic" applications that mix Unix's speed and multitasking with Macintosh functionality. A symbiotic program that used a service such as QuickTime would still be required to run the Apple application

engine in the background, Cleveland said.

Apple is working on Macintosh Application Services for a half-dozen Unix environments, including AIX, Solaris and HP-UX, although the company has not yet announced products. The company said it will conceivably even do a version for Microsoft Windows NT.

"We don't own the enterprise, and we're not a dominant provider," Cleveland said. "So we now need to do the unbundled approach, with a solution for a variety of environments." □

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Acrobat

From Page 1

files to be imaged on virtually any monitor or printer regardless of its resolution.

► **Acrobat Exchange** lets users view, navigate, annotate and create HyperCard-style links in PDF files. It ships with ATM 3.6, which provides the font rendering and substitution required to preserve a file's original look.

Exchange provides a rich set of viewing and navigation tools in its menus and a tool bar similar to the one found in Microsoft Word. Exchange users can also enhance PDF files with hierarchically organized bookmarks and thumbnails that facilitate navigation. These appear to the left of the document in a horizontally split window. A Find command lets users search for text anywhere within a document. Text can also be copied with a selection tool.

A Link tool in the tool bar allows users to define screen regions as hypertext buttons.

Exchange users can annotate documents created by others by inserting text notes within a document. Users can search for notes and combine their contents into a new summary document. Notes can be freely moved around the document and reduced to icons.

► **Acrobat Reader**, a scaled-down, less expensive version of Acrobat Exchange, allows users to view, navigate and print PDF files, but it cannot generate bookmarks, thumbnails, notes or links.

► **PDF files** can be created from most documents by using the PDFWriter Chooser extension included with Acrobat Exchange. PDFWriter's sparse Print dialog provides options for printing only an entire document or a page range. PDFWriter then presents the standard Save dialog in which users specify a name and folder for the PDF file.

Adobe provides a control panel similar to those bundled with popular fax drivers that allows users to switch to PDFWriter by holding down a modifier key when they choose the

Print command from within an application.

Documents containing Encapsulated PostScript or high-quality, 16- or 24-bit-color images must be converted to PDF format through Acrobat Distiller. If a document contains an EPS file, only that EPS image's low-resolution PICT preview will be saved as part of the PDF unless the Distiller is used.

► **Acrobat Distiller**, primarily intended for networked environments, has special features for dealing with numerous PostScript files. Large, color bit maps can be downsampled to a lower number of bits per pixel or compressed using different degrees of JPEG (Joint Photographic Experts Group) compression.

Acrobat has a few surface limitations. There is no free viewer available, although Adobe will release an application programming interface to anyone who wants to create one. Adobe needs to address what stand-alone users should do if they want to create a PDF file with a simple EPS. A mechanism for text searches across multiple documents is also a major requirement for corporate file repositories.

Adobe plans to enhance Acrobat through support for optical character recognition, Standard Generalized Markup Language and other enhancements the company describes as "unannounced or unpredicted."

Acrobat Exchange will cost from \$146 to \$195 per user, depending on quantity. Acrobat Reader will list from \$35 to \$50 per user. A single-user version of Acrobat Distiller will list for \$695, while a version that allows unlimited network users will list for \$2,495.

Adobe's pricing of the Acrobat pieces indicates that it is more interested in professional or corporate electronic distribution than in providing a lingua franca. Looked at in this way, the Acrobat technology is very rich.

Adobe Systems Inc. is at 1585 Charleston Road, P.O. Box 7900, Mountain View, Calif. 94039-7900. Phone (415) 961-4400; fax (415) 961-3769. □

Dataproducts

From Page 1

accounting and context-management options for virtual printers, although initial releases will not support this feature.

Dataproducts said it will use VPT in its own printers and license the technology to other vendors, which sources said include Apple.

VPT will be offered as an \$800 option with Dataproducts' LZR 1580 and included with the LZR 2080 printers. Dataproducts' new 15- and 20-page-per-minute laser printers can output 8.5-by-11-inch or 11-by-17-inch pages at a maximum resolution of 800 by 800 dpi.

Like the company's earlier LZR 1560 model, both new printers are built around Fuji Xerox engines. They run on a 7.5-MHz Weitek 8200 RISC processor, and each includes 8 Mbytes of RAM, expandable to 32 Mbytes. Both come with Adobe PostScript Level 2 and 35 resident Type 1 fonts.

The printers will ship with LocalTalk, RS-232 serial and Centronics parallel interfaces. With VPT, they will support Ethernet. The devices also include a SCSI port for a hard drive. Users will be able to purchase an internal Level 2 fax modem for \$399.

Without VPT, the LZR 1580 costs \$3,450, \$3,795 and \$3,995 with one, two and three 250-sheet paper trays, respectively. The LZR 2080 retails for \$4,995, \$5,295 and \$5,495 in the same configurations; these prices include VPT.

According to sources, Apple will offer VPT with its repackaged versions of the LZR 1580 and 2080. The Apple models, due by August's Macworld Expo in Boston, will be called the LaserWriter 800 and 810 (see MacWEEK, May 31).

Dataproducts Corp. is at 6219 De Soto Ave., P.O. Box 746, Woodland Hills, Calif. 91365-0746. Phone (818) 887-8000; fax (818) 887-4789. □

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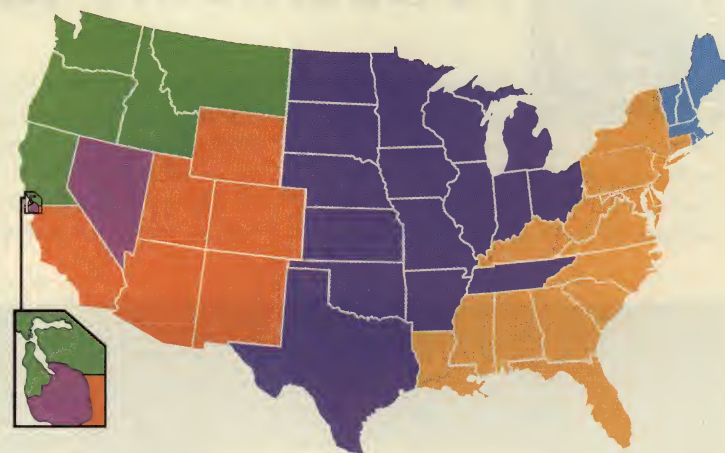
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*For more information on these articles, call (415) 243-3581.



A decidedly different Duo dock

About the only way to deal with the harsh lessons that life dishes out is to try to observe the mistakes of others, learn the lessons therein, and then move on to make bigger and better mistakes of your own. At least,

that's the attitude the Knife has adopted. Just the other day he was commenting that if he had a nickel for every golfing wager he's won from Michael Jordan ...

And apparently the third-party developer community hasn't been too hot on the odds

of making money in the PowerBook Duo dock market. It's been a while now, and most of the promised or hinted-at third-party docks have yet to ship. Surely Apple, which is thought to have considered docks to be the great third-party opportunity in the Duo

market, is sorely disappointed. Of the products that have shipped, few offer any compelling features that aren't already available in one all-in-one PowerBook or another.

That situation should change by the August Macworld Expo. The Knife reports that Lapis Technologies Inc. has chosen that popular venue to ship its first dock product. Sources who have seen preproduction models say that it shares the same form factor as Apple's Duo Floppy Disk Adapter. The features include a PowerBook-standard HDI-30 SCSI connector, an Apple Desktop Bus port and a security port designed to work with Kensington's security cabling. In an age when you're as likely to want to hook up with the occasional CD-ROM drive as a floppy disk, the Lapis offering could prove to be a winner, especially at the projected less-than-\$200 suggested retail price.

Space station minus five. While the FOBs in Washington are occupied reshaping the executive branch in the image of the Little Rock state house, the crowd manning the good ship Radius are busy fine-tuning a mid-course correction of their own. The Knife has learned that five top people have already left, and not without affecting products in development. The Skylab project, for example, has suffered its fourth known delay in the history of its more than two-year gestation period. It was scheduled to debut at the Digital World conference but now won't see the light of day until this fall. So if you're looking for excitement at the Radius booth, you'll have to make do with the new VideoVision JPEG compression daughterboard.

Frequent flyers. Apple executives are a busy lot — so busy that they barely have time to commute home, much less the slightly more time-consuming commute to Austin. But here's the Knife with multiple sightings of many top Apple brass, carry-on bag in hand, heading down to the home of Texas swing.

Now Austin has a lot to recommend it, but it's not as if there were some blow-out sale of discontinued Mac models, similar to the one going on last week at the Wal-Mart in Grand Forks, N.D., where discontinued Classics could be had for a mere \$599.

The Knife suggests that Sculley and a few of his chosen underlings are in the midst of some delicate negotiations with Dell Computer. As to what Apple and Dell could have to talk about, the Knife points to several possibilities.

First, there's the matter of the Star Trek project, Apple's plan to combine the power of the Finder with the mystery of DR DOS. A bundling agreement with a major PC player such as Dell would certainly give this improbable project a helpful bootstrap. Or perhaps Dell, already intimately familiar with Apple's laptop success, is interested in learning how to boost its own stalled laptop offerings. Then there's always the chance that the subject of the discussions is something entirely expected and mundane, such as transplanting the Newton OS to an Intel platform. And that's just the beginning of the possibilities. □

With the sunny season nearly upon us, don't face the heat without a MacWEEK mug to show for your efforts. The Knife's chillin' at (415) 243-3544, fax (415) 243-3650, Internet (mac_the_knife@macweek.ziff.com), AppleLink (MacWEEK) or CompuServe/ZiffNet/Mac.



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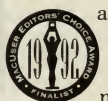


HOW TO BE NEAT, PRECISE AND ORGANIZED. WITHOUT BECOMING ONE OF THOSE OBNOXIOUS PEOPLE WHO ARE NEAT, PRECISE AND ORGANIZED.

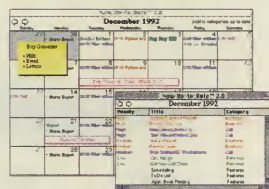
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Now Up-to-Date lets you schedule appointments and To Do's instantly—just click on the date you want and then enter your information.



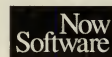
Calendars can be printed in all major appointment book sizes and formats, in a wide variety of views and styles. You can even print out wall charts.

your calendar with the other folks on your network. In return, they'll no doubt share meeting dates and whatnot with you. Not on a network? No sweat, Now Up-to-Date still works fine all by itself.

Step 5: Fly to Zimbabwe and bring up your calendar on your PowerBook. Good. Now change everything. Perfect. Now connect to your office via modem. Presto! All your calendars automatically update themselves.

Step 6: Pick up Now Up-to-Date 2.0. Or, for more info, call us at 1-800-237-3611.

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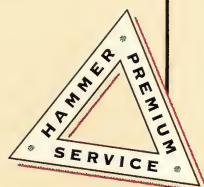
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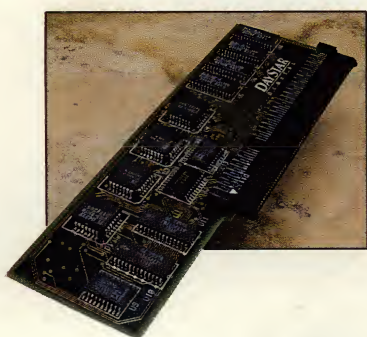
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